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CONNECTIONS, PATHS, AND EXPLANATIONS - A SOCIAL NETWORK APPROACH TO INVESTIGATING EXPERIENCES OF EARLY CHILDHOOD SPECIAL EDUCATION WITH THE ECLS-K

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ABSTRACT OF DISSERTATION

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ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the
Requirements for the degree of Doctor of philosophy in the
College of Education
At the University of Kentucky

By
Kathryn Shirley Akers

Lexington, KY

Director: Dr. Kelly D. Bradley, Associate Professor of Education

Lexington, Kentucky

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CONNECTIONS, PATHS, AND EXPLANATIONS- A SOCIAL NETWORK APPROACH TO INVESTIGATING EXPERIENCES OF EARLY CHILDHOOD SPECIAL EDUCATION WITH THE ECLS-K

The purpose of this study is to demonstrate a practical application of social network analysis in the field of education using a large-scale data source. Using the Early Childhood Longitudinal Base Year data, a network is identified by examining the connections that occur between supports, both inside and outside formal special education resources for kindergarteners with access to special education programs.

Social network mappings and quantitative findings are presented for formal and informal supports and primary disability category, along with policy implications and suggestions for further research. Findings indicate that social network analysis offers a unique and innovative perspective to educational research.

KEYWORDS: Social Network Analysis, 2-mode data analysis, Early Childhood Longitudinal Study, Special Education supports, education research methods

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4-1-2011
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Kate Akers

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Introduction

Ecological Systems Theory states that children develop within a context of their relationships (Bronfenbrenner, 1979). Particularly for students who have access to special education programs, these relationships can have profound effects on their development, growth and success. These relationships can take many forms, including supports offered inside or outside the context of special education. It is critical that the relationships between these supports are analyzed. This research can be used by policy makers, school administrators, teachers and parents to ensure that children with access to special education programs receive proper support.

This study will demonstrate a practical application of social network analysis in the field of education. Despite the popularity of social network in fields such as sociology, anthropology, medicine and business, little education research uses social network analysis. One specific population within the field of education that would benefit from a social network analysis study are students with access to special education programs. The advantages of using social network analysis include being able to visualize, measure and compare networks of support systems for these children. This study will use the Early Childhood Longitudinal Study, Kindergarten class of 1998-99, ECLS-K base year to apply social network analysis techniques and examine the supports of families with children with access to special education programs.

1.1 Introduction to Social Network Analysis

Social network analysis is the study of individuals or groups and their connections. The study of social networks is the actual study of the relationship between individuals and groups, rather than the individuals themselves. For example, consider the labor market. When an individual tries to find a job, they consult newspapers, magazines as well as their contacts. There is an age old saying “It’s not what you know, but who you know.” Social network analysis is the study of this exact phrase. It confirms this quote with another statement, that what you know depends on who you know. The study of social network analysis enables researchers to study the different connections, and different types of connections that make individuals effective, successful and happy.

Social network analysis addresses the labor market example by showing a map of a job seeker, the corresponding people he or she is connected to, and the people to whom the corresponding people are connected. A person may then have the most success finding a job not in a newspaper or with an online job search site, but by talking with people he or she knows. These people then, in turn, talk to the people they know. This process of interacting enables the person to find a job using their social network. By studying social networks, we are actually studying the relationships an individual has with his or her contacts in a way that we previously could not. Prior research only allowed us to count the number of ties individuals had or speculate the strength of these ties. Social network analysis allows us view a mapping of the individual’s ties and the strength of these ties at the same time.

Having the ability to analyze social networks on this level, the structure of the network can be visualized and the network structure analyzed to understand how network

structure affects substantive outcomes. Additionally, ego, or individual networks, can be viewed and examined to see how the structures of individual networks differ. This breakthrough shows researchers and policy makers a clearer and more accurate view of networks. Analyzing social networks on this level enables the family member, teacher, practitioner and researcher to view the structure of a network and understand how it affects substantive outcomes.

1.2 Purpose and objectives of the study

Although social network analysis, through both visual mappings and quantitative methodology are demonstrated throughout the literature of business, sociology, medicine and anthropology, very few studies examine the networks found in educational research. The purpose of this study is to demonstrate the power and practicality of social network analysis through the examination of a 2-mode data network identified within a large scale data source. The network is created by examining the connections that occur between supports, both inside and outside formal special education resources for kindergarteners with access to special education programs.

The literature demonstrates a strong relationship between the availability and utilization of supports and the development progress for children with access to special education programs. Despite this indication, very little research takes this evidence to the next level, meaning an examination of the relationships between supports. This step provides critical insights to policy makers, teachers, school administrators and parents by enabling them to see the network of support systems utilized and to gain insights as to the key, or most central, supports and their relationship with less central supports. A combination of visual mappings and quantitative results will be provided.

Research questions

Using existing data from ECLS-K base year, this study proposes several research questions centered around two important aspects of social network analysis: 1) the creation of several network mappings to serve as a visual display of network activity for supports utilized and 2) quantitative analysis identifying and measuring key characteristics of the support networks evaluated in the ECLS-K. Specifically, the research questions guiding the current study are:

1. What are the frequencies, types and categories of supports used by families of children who have access to special education programs?
2. What might social network mappings, of these supports and their common members look like and how might they relate to Bronfenbrenner's Ecological Model for human development?
3. How do the different measures of centrality, strength of ties and density vary through different populations in the data set?
4. What might the quantitative findings, using traditional social networking techniques described above, tell us about the population and policy implications?

1.3 Limitations

There are two primary limitations to this study. The first limitation involves the manner in which the data for parents were collected. According to the guidelines stated by NCES, trained interview personnel called the parent at home and conducted a 45-50 minute interview. To record the parent's responses, computer assisted interviewing methods were used to attempt to minimize the effect of multiple interviewers. Interviewers also conducted in person interviews to accommodate for parents without

access to a telephone (ECLS-K, 2010). This may cause some variation in data collection methods throughout the parent survey, the primary survey used for this study. However, because the questions used from the parent survey for this study are dichotomous in nature, ie either the family or child used the support or they did not, the effects of differences in data collection methods are minimized. There is also evidence that mothers, rather than fathers or other caregivers, were the primary respondents to the phone survey. Therefore, the parent study may only be examining responses from the maternal caregiver. For this particular study, the fact that mother's primarily answer the phone is a methodological strength in that it adds to the consistency and reliability of the survey data and the networks created using the data.

The Early Childhood Longitudinal Study was not designed as a specific study geared towards students with disabilities. Therefore, there is variation in the ways students were identified as having a disability. There is no concrete variable in the dataset that identifies these children, but rather NCES makes suggestions about ways in which students with disabilities may be identified. Examples of these are whether or not the child has an Individualized Education Plan, or IEP, on file with the school, if the parent or home teacher identifies that the student has had access to special education programs and whether or not they have a special education teacher interview on file (ECLS-K, 2010). To reduce the issues of identification, for the purposes of this study, only students who have an IEP on file with the school will be used in the analysis. In general, the benefits of using the ECLS-K far out weight the limitations of the data set. The ECLS-K was chosen for this study because of its ongoing support as a national, longitudinal data set and the generalizability of the sample to the population of kindergartners in 1998-99.

1.4 Significance of study and contribution to the field

This study has methodological and practical implications. It will give a demonstration of the usefulness of social network analysis in the study of education. Unlike traditional statistical techniques, such as regression and factor analysis, social network analysis enables researchers to create a visual display backed by quantitative findings that can inform policy makers and influence daily lives of students with special needs. From a practical standpoint this study will serve as a measure that can be used to evaluate many different types of support systems used by families for children in special education.

1.4.1 Special education.

As demonstrated in the literature, the availability and utilization of supports is a critical step in a child's development, and even more so for a child with access to special education programs. Within special education, every child's experience is unique and there are numerous combinations of experiences that can support development. Therefore, it is critical for researchers to develop measurements that can be used to help evaluate current policy relate to these children and their specific development. This will allow policy makers to have the ability to understand these measurements and incorporate them in to evaluations for current policies and creating new policies.

There are several policy issues that can be addressed by assessing the social networks of special education students. The Individuals with Disabilities Education Act governs how states and public agencies provide early intervention, special education, and related service to children (birth to 21 years old) with disabilities (IDEA 1990,1991, 2004). IDEA requires that states receiving funding must provide students with education

that prepares them for further education, employment and independent living. For special education students, this education must be designed to meet their unique learning needs.

This analysis has very practical applications. It can help inform policy makers about the importance of social networks in educational attainment, as well as inform teachers and parents about their roles in a child's network. Support provided for families must be meaningful and relevant. Understanding the relationships between the different types of supports offered is a significant component to this evaluation. Assessing the relationships between federally mandated programs, such as Head Start, has a direct relationship to policy makers. Although the number of children who are using these supports is known, the relationship between these supports and other formal and informal supports is not known.

1.4.2 Social Network Analysis

In addition to the network visualization and implication for policy makers and families, this study also adds to the body of literature surrounding social network analysis. As demonstrated in the review of the literature despite the ever growing popularity of social network analysis in fields such as medicine, sociology and business, very few social network studies evaluate networks in an educational setting. This study opens up the field of special education research, and general education research to the increasing methodological power of social network analysis. This study also contributes to the field of social network analysis by utilizing a large dataset and variable weights to further explore of applications of 2-mode data.

1.5 Overview of Study

This study serves as a methodological demonstration of the power and practicality for using social network analysis in education research. Chapter 1 sought to introduce social network analysis with regards to research in special education and to outline the purposes, limitations and significance of this study. Chapter 2 will consist of a synthesis of the literature surrounding the importance of supports and ways to visualize these supports. With respect to social network analysis, Chapter 2 will introduce the literature addressing social network theory, methodological framework, applications for education and issues related to 2-mode networks. Chapter 3 will define the measures used in this study as well as the processes employed to complete the social network analysis. Specifically, a cross sectional component of a large-scale, longitudinal data set is analyzed to identify the network structure of support systems utilized by families of children with access to special education programming. This network will be identified, visualized and measured using traditional techniques such as centrality, density and strength of ties analyses. This study will demonstrate the utility of social network analysis in the treatment of 2-mode data extracted from large-scale longitudinal datasets along with variable weights to offer a practical, data driven policy application that can be generalized and utilized by families, teachers, community leaders and policy makers.

Chapter 2

Review of the Literature

This study utilizes and incorporates several very distinct bodies of literature. Included in this review are literature on social network methods, network theory and applications and literature on the importance of supports for students that have access to special education programs. First a brief introduction to the literature addressing network theory and the methodological framework of social network analysis is given. A synopsis of the social network analysis applications in literature is then addressed. Another critical component of this study, techniques for handling 2-mode data are also introduced. Because this study is designed not only as a demonstration of the power of social network analysis, but also a practical application for social network analysis, the Individuals with Disabilities Education Act (IDEA 1990, 1991, 2004) is discussed to demonstrate the importance of this study with regards to policy applications for families and students with access to special education programs. In addition to the policy application IDEA presents, the importance of supports for students who have access to special education programs as well as previous visualization techniques of these supports and resources are also discussed.

2.1 Social Network Analysis

The first section reviews the literature pertaining to social network theory and methodological framework, applications of social network analysis in educational research and an introduction to the use of 2-mode network data in social network analysis literature. Social network theory strengths lie in the strong methodological framework used to develop and analyze social network theory. The second section pertains to the

application of social network analysis methods to education by measuring social capital. This method, while practical and applicable, is not used fully in education research. The final section examines the use of 2-mode data, the type of data used in this study, and gives a review of current literature addresses issues related to analyses on 2-mode matrices.

2.1.1 Social network theory.

Social network analysis holds its roots in psychology, anthropology, sociology and mathematics (Scott, 2000). The modern use of social network analysis originated in medical research as a method to explain the dissemination of the AIDS virus (Borgatti, Mehra, Brass, & Labiana, 2009). It is now used in both professional and academic fields to examine relationships and their effects on change, productivity and information sharing. Despite its growing popularity, the use of social network analysis in education is very limited.

One of the strengths of social network analysis is that the theory, methodology and practice are all centered around one fundamental construct: the network. Social network theory, as distinguished from theory of networks and social capital theories, is comprised of several theories (Adler & Kwon, 2002). The following list of theories, although not exhaustive, is critical to the understanding and implementation of social network analysis and will be described in the following paragraphs. The theories discussed in this review are: weak ties, social resource theory, cognitive dissonance and structural holes theory.

Granovetter's much debated "Theory of Weak Ties" is one approach to the conceptualization of social capital. Focusing on the strength of the social tie used by

person in the process of finding a job, he argued that ties among members of social cliques are more likely to be strong ties. Therefore information is spread quickly among members. But he says that ties outside one's social clique are more likely to be "weak," and information would not spread as quickly, if at all. The idea behind tie strength is that strong ties are ties that would happen between close friends or family and have many overlapping ties. Strong ties are the sources of much information, but it may be repeated numerous times within the network, because information that reaches any of them is likely to reach all of them. Weak ties take the form of acquaintances, and therefore are often the sources of new information (Granovetter, 1973). Weak ties create a bridge by which information can be shared between two different interconnected groups. Granovetter's findings indicate that weak ties are more likely to be the source of information on job openings.

In opposition to Granovetter's "Weak Ties", Burt's (Burt, 1992) structural holes approach focused on the pattern of relations among those that the individual is connected, rather than the individual's direct ties. A structural hole exists when no tie exists between two individuals. A network with many structural holes, according to Burt, has several advantages. The people in the network have access to greater amounts of information. They have more power over resources because of bargaining, and the career opportunities across the network are more visible. Burt argued against Granvovetter, stating that the structural hole approach better explains the bridging concept than that of "Weak Ties"(Burt, 1997).

Lin et al. (Lin, Ensel, & Vaughn, 1981) uses social resources theory, which focuses on the nature of the resources within the network. This theory relates less to the

strength of tie, and more to the purpose for the tie. It states that two nodes are more likely to have a tie if they need a resource that the other has access to. An individual who has the resources that an ego wants could be considered a "social resource" (Lin, Ensel, & Vaughn, 1981). Although all three have different approaches to the conceptualization of social capital, they all are subtly referring to social networking analysis.

The final network theory addressed is that of cognitive dissonance theory. Simply put, this theory states: if A likes B and B likes C, A will preferably like C also, to avoid possible dissonance in the group (Cartwright & Harary, 1956; Heidler, 1958). This theory is critical to social network analysis because it addresses the concept of bridging ties. These ties are essentially shortcuts between two points, or ties that serve as a previously unrealized, opportunistic connection. This concept allows for innovation when an additional person is added to the group or conversation (Borgatti, et al., 2009).

In addition to the literature on the history and theoretical development of social network analysis, another distinct component addressed throughout the literature is the focus of social network analysis mathematical foundations (Freeman, 1984). Barnes and Harary emphasis the importance and fundamental value of graph theory to social network analysis (1983). Graph theory serves as the methodological backbone for social network analysis, similarly to the theoretical background imposed by Granvovetter, Burt, Lin and Heidler.

A primary purpose of this study is to visually display the connections between different supports utilized by families of special education children. By using graph theory, social network analysis enables researchers to see a snapshot of the current network, and to use mathematical operations to quantify and measure the network

characteristics (Freeman, 1984; Wasserman & Faust, 1994). Unlike traditional statistical analysis, social network analysis allows policy makers, school administrators, teachers and parents to see visual representations of support networks. These networks can be created using UCINET, and NetDraw, traditional social network analysis software utilized by researchers (S.P. Borgatti, 2002; Borgatti, Everett, & Freeman, 2002).

2.1.2 Social network applications in education.

Conceivably one of the most practical applications for social network analysis in education is as a measure of social capital (Burt, 2000). One of the earliest recordings of social capital in the literature was from a state supervisor of rural schools in 1920. Hanifan (1920) contrasts social capital from other forms of capital such as personal property, real estate, or cash. He claims that social capital refers to

> "That in the life which tends to make those tangible substances count for the most in the daily lives of people: namely good will, fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit, the rural community, whose logical center is in most cases the school."

Hanifan states that interactions such as those that occur between two neighbors are a form of social capital. Bourdieu writes that social capital may otherwise be defined as 'connections' and that it is accumulated, transmitted and reproduced through clubs, families, and other sorts of interaction(Anheier & Romo, 1995; Bourdieu & Nice, 1972, 1977). Loury also writes "no one travels the road entirely alone" (1977). He defines social capital as the set of resources that aid in human development.

Arguably the most influential work on the development of social capital theory was The Equality of Education Act, otherwise known as "The Coleman Report"

(Coleman, 1966). Coleman found that there were differences in education attainment that went beyond human capital. In “Social Capital and the Creation of Human Capital”, Coleman claims that it is through Loury’s definition of social capital that resources are different for different persons (Coleman, 1988).These resources are vital in the development of human capital.

The transition from defining to operationalizing and measuring social capital is no simple task for researchers. Social network analysis is the physical representation, through maps and analyses, of social capital theory. Social network analysis shows the informal relationships within organizations that are often critical to understanding where the creative pockets and informal relationships reside. SNA can be very useful when changes are made within any organization and to track the diffusion of knowledge. For education, this operationalization represents a critical step towards a data driven decision process. As previously demonstrated, few educational researchers employ the power and practicality of social networks in their research practices.

In addition to Hanifan’s work in education through *The Rural Community Center* and Coleman’s notable report, a few studies have capitalized on the functionality of social network analysis in education research. Some of the more notable include a 2006 study employing social network analysis to explore the relationship between centrality and behavioral characteristics in early elementary school students (Farmer & Rodkin). Behavioral characteristics, such as aggressively, disruptiveness and studiousness were measured and then analyzed along with the student’s network centrality. Network density, among other factors, has also been demonstrated to be statistically important and unique in predicting academic performance (Rizzuto, LeDoux, & Hatala, 2009).

Some network studies have been developed within the field of higher education as well. Strategy for change, as demonstrated through ties to organizations can be evaluated through colleges and universities (Kraatz, 1998). Patterns of communication, as measured through their social networks, can be used to examine donor patterns and networks within university settings (Bryant, 1998). Additionally, examining the networks created by giving patterns in young alumni can help predict whether or not an alum will donate back to their alma matter (Akers & McDearmon, Forthcoming). Faculty member's intradepartmental interactions create an important component with regards to research productivity, general support and encouragement (Pifer, 2010). The social networks created by master's and doctoral committees represent not only a pivotal point in a graduate students career but are also a key component to the structure graduate degree programs (Akers & Bradley, Forthcoming).

2.1.3 Network techniques for 2-mode data.

One key, unique component to this study is rooted in the 2-mode nature of the data themselves. The majority of network data are composed of one-mode, or actor by actor matrices. Discrete numbers indicate whether a relationship exists and to what extent. Borgatti (Forthcoming) identifies 2-mode, or two-dimensional, matrix as matrices that include rows and columns composed of different entities. For example, a 2-mode matrix may consist of actors, or people, listed on the rows and different community service organizations listed on the columns. Essentially, 1 or 0 might indicated a persons involvement, or lack thereof in the organization. In addition to group membership, other examples of 2-mode data include attendance records, actor by trait and actor by

possession matrices. 2-mode data are relational and do arise naturally throughout networks. This can happen by nature of the network or through data collection.

One of the most cited examples of 2-mode data come from the 1941 social anthropological study, Deep South. In this example, women were asked what events they attended over a 6 month period (Davis, Gardner, & Gardner, 1941). The result is a 2-mode matrix listing the women in the study along the rows and the events attended in the columns. In addition to measuring the fascinating phenomena of caste and class, this study serves as a methodological breakthrough in working with 2-mode data. This data set serves an example of collecting 2-mode data as a preliminary step toward creating and analyzing a 1-mode dataset. By transforming this dataset into a woman by woman or event by event dataset gives a social proximity measure that could reflect in a positive tie.

The network structure of 2-mode data is very different from 1-mode data. Therefore, before social network analysis can be performed, it must first be shown that it is appropriate to use traditional social network analyses on 2-mode data. Ties between organizations, through their mutual members are considered to be pathways through which organizations influence each other, and are therefore appropriate for social network analysis (Borgatti, Forthcoming; Borgatti & Everett, 1997). When 2-mode data are converted into 1-mode data, it is possible to apply traditional social network analysis techniques, and even theories (Borgatti & Everett; Borgatti, et al.). Much in the same manner, visualization of 2-mode networks can be created similar to 1-mode data sets by the use of Multidimensional Scaling techniques, or MDS (Bonacich, 1972; Borgatti, Forthcoming; Hanneman & Riddle, 2005).

2.2 Special Education

According to Bronfenbrenner's, "a child's world is organized as a set of nested structures, each inside the next, like a set of Russian dolls" (Bronfenbrenner, 1979). In ecological systems theory, the first circle represents the child within overlapping circles consisting of family, school and peers embedded within a larger context of social, economic, and cultural influences. Another contemporary theoretical framework that support the use of mapping supports include family empowerment theory (Dunst, Trivette, & Deal, 1994, Dunst 2000). In addition to examining the role of the parent in development of the child, this theory also examines family-centered services and availability of resources (Turnbull, Turbiville, & Turnbull, 2000). The relationships children and their families build can have a great impact on the availability and quality of support services. In addition to Bronfennbrenner's theory, other theories note the importance of the connections families have access to. The focus of family systems theory is on how individuals related to one another rather than on the individuals themselves (Bowen 1966). Similar to social network analysis, family systems theory examines the relationships, rather than the individuals themselves as well as the structures and boundaries created by these relationships.

This section gives an overview of the Individuals with Disabilities Act (IDEA), the importance of quality and intensity of supports and visual techniques for mapping supports for students with access to special education programs.

2.2.1 Individuals with Disabilities Act (IDEA).

The Individuals with Disabilities ACT, or IDEA, was created in 1975 and reauthorized in 1986, 1991, 1997 and 2004 as federal legislation that that ensures services

to children and youths, age birth to 21, with disabilities. The most current IDEA website claims IDEA covers over 6.5 million disabled children and youth throughout the United States (2010). Part B covers children and youth ages 3-21, and part C covers infants from birth through 2 years of age. IDEA offers resources and solutions for teachers, practitioners and families of children with access to special education programs.

One of the main purpose statements of IDEA identifies the mission of IDEA and their goals for families. There is a need "to enhance the capacity of families to meet the special needs of their infants and toddlers with disabilities" (IDEA 1990, 1991, 1994, 2000). One way capacities of families can be met is by ensuring that families receive adequate and relevant supports from the federal government that meet their children's specific needs. Assessment of the needs of children impacted by IDEA is a critical component of selecting appropriate support services.

2.2.2 Support services

These relationships can be broken down into three broad categories: emotional, material and informational (Dunst, Trivette, & Deal, 1988, Dunst 2000).The supports in each of these categories can then be classified into two groups: formal and informal. Formal supports are made up of people and groups of people or agencies that are formally organized for the purpose of responding to particular family needs. Health care providers, medical specialists, therapists, hospitals, and early intervention programs are examples of formal supports. Informal supports include those people and groups that became a part of families' lives for reasons other than their child's disability. Extended family, neighbors, friends, churches, and recreational clubs are examples of informal supports (Dunst, et al., 1988). The development and validation of questionnaires to

determine which of these supports are needed can help researchers define supports and their role in the development of the child and families (Leung, Lau, Chan, Lan, & Chui, 2010).

The need for supports remains constant throughout a child's life, regardless of their access to special education programs (Guralnick, 2005). When children are identified with having developmental delays or other disabilities, the need for these supports become not only a constant but play a vital role in the development of the child. Availability and then utilization of supports has been shown to impact a wide variety of outcomes for children who have access to special education programs. Busillio-Aguayo, in her 2010 dissertation, demonstrates the importance of access to social and resource supports for families with children identified with special needs and over 3 years of age (2010). Caregivers, or family members, also identify specific supports, such as development of recreation and after school programs as a top priority (Marcenko, Keller, & Delaney, 2001). Other findings indicate that appropriate supports can lessen the level of parental stress in parents whose children have access to special education programs (Floyd & Gallagher, 1997).

The availability of supports and the quality of those supports is also identified in the literature to have a modest, long term effect on the cognitive and socioemotional development of their preschool backgrounds. Peisner-Feinberg, et al. found this effect to be even more prevalent for students with more at-risk backgrounds, such as students with access to special education programs (Peisner-Feinberg et al., 2001). Other studies report the availability in early intervention programs to improve cognitive ability (Ramey & Ramey, 1999) as well as the importance of supports in the role of identifying students

who may need access to special education programs (Redden et al., 2001). Supports may also be a factor in community adjustment and personal competence goals for inclusion (Bruininks, Chen, Lakin, & McGrew, 1992).

For students that live in rural communities, access to and availability of supports can be even more critical in their development. Research indicates a significant difference in availability of supports and services, or lack thereof, for rural communities (Mallory, reprinted in 2010; Rude et al., 2005). In a study utilizing the ECLS-K, Jung and Bradley (2006) found significant differences in amount of time students spent immersed in regular classrooms and frequency of communication between special education professionals and families for students in rural locations. It may be plausible that other factors also vary by level of ruralicity. This further emphasizes the importance of relationship based services for students with access to special education programs in rural communities.

In addition to the need for formal supports such as Head Start and special education programs offered in schools, access to and participation in informal supports are also critical to families of children who have access to special education programs. The National Early Intervention Longitudinal Study (NEILS) shows that although 85% of parents agreed or strongly agreed that they had adequate informal support network, one third reported that they did not have as many opportunities to participate in community activities as they would have wanted (Hebbeler et al., 2007). Other large scale assessment studies find similar outcomes with regard to the importance of supports. In a 2010 large scale assessment study utilizing the Family Outcome's Survey, two principal components were identified, family knowledge and ability, and family support and community

services. This second component included items asking about support services, accessing desired services, programs and activities (Raspa et al., 2010), many of which are also identified on the ECLS-K.for Bronfenbrenner's model, combined with the categories mentioned previously, can be used define the social network of supports for special education children.

Among these important outcomes are successful transitions from preschool to kindergarten (Ramey & Ramey, 1999; Troup & Malone, 2002). Transitional studies, such as the NECTC study, the National Early Childhood Transition Center, also identify the importance of supports offered to families of children who have access to special education programs (Rous, Harbin, & McCormick, 2006). Research questions address how and to what extent to environments of children, parents and teachers impact outcomes for students. Availability and appropriateness of supports may also have an effect on other important transitions later in life. Transitions such as from grade school to post secondary and post secondary to college or employment are also important. Specifically, research indicates level and quality of support have an effect on the transitions between education supports and employment (Stodden, Whelley, Chang, & Harding, 2001).

2.2.3 Visual mapping for special education supports.

The need for visual mapping of these supports is evidenced throughout practice in special education. Eco mapping is one example of the visualization of the supports used by families. Eco mapping consists of a diagram of an individual's connections, resources and supports. It also includes a measure of the relative strength of each support (Hartman, 1978; McCormick, Stricklin, Nowak, & Rous, 2008; Olsen, Dudley-Brown, &

McMullen, 2004). These mappings can be practitioner created without family involvement, family constructed with assistance from a practitioner or as a collaborative process between practitioner and the family. Essentially Eco maps create a visual representation that can be used for intervention planning, determining the need for additional supports, determining goals, evaluating and measuring change, and to clarify the nature of the early intervention (Jung, in press). These mappings are often simple sketches and are not used to make any hypothesis about the population (Crane & Skinner, 2003).

2.3 Overview

This chapter demonstrates the importance of this study by examining several distinct bodies of literature. Literature on social network theories and applications were addressed as well as the literature identifying the purpose and importance of supports for policy makers, administrators, teachers and families of students with access to special education programs. The next section, Chapter 3, will describe the methodological process that will be implemented to create a network of supports. In this chapter, the data source and instrumentation will be identified, along with a detailed data analysis section laying out the critical steps used to evaluate a network.

Chapter 3

Methodology

The literature on the importance of supports, both informal and formal, provides valuable insights on the success of children who have access to special education programs. However, it fails to demonstrates the connections, and lack there-of, between the supports themselves.

3.1 Data Source

The guiding research questions for this study seek to visualize and measure characteristics of the network created by the support systems utilized by families of children with access to special education programs. To complete a social network analysis for support systems utilized by families of children with access to special education programs, an appropriate data set that includes a network must be identified. The Early Childhood Longitudinal Study, Kindergarten class of 1998-99, ECLS-K data set was chosen for this study because of the ongoing support it has received as a national, longitudinal data set. By using this data set, the results of this study can be generalized and used to effect nationwide policy. The ECLS-K followed a nationally representative sample of about 22,000 kindergartners through their fifth grade year. This data set involved periodic questionnaires to parents, teachers, students, and school administrators as well as data from students' transcripts. Questionnaires sought to measure cognitive and psychomotor skills, as well as home and school resources and environment (NCES, 2000).

The ECLS-K data set hold a variety of different variables that easily lend themselves to the study of social networks. The restricted use data set also includes

children with access to special education programs. This study will focus on the students who have access to special education programs and their family's use of formal and informal supports. There is great variation in the collection of special education data, little accountability within and across states and a lack of large-scale studies resulting in generalizable statements (Odom et al., 2005). The ECLS-K data set was chosen for this study because of the ongoing support it has received as a national, longitudinal data set. By using this data set, the results of this study can be generalized and used to effect nationwide policy.

3.1.1 Instrumentation.

The guiding research questions all address measures of the network created by supports used by families. In order to address these questions, appropriate instruments identifying the network must be selected. The ECLS-K provides several questionnaires whose aim was to measure the resources available at both home and school for all students. For students who have an IEP on file with the school, questionnaires also addressed formal services offered specifically to those students such as speech therapy. The instruments used for this study include fall questionnaires for parents, school administrators, and school abstracts as well as the spring questionnaire for parents. The fall and spring parent interviews offer questions that inquire about supports, both formal and informal, used by parents of children with access to special education programs. These questions and complementary variables map directly back to the guiding research questions and are used in identification, visualization and measurement of the network created by these supports. Items identifying the network are found through questions in the fall and spring parent interview questionnaires. These questionnaires included

questions about current household members, languages spoken in the home, activities and social skills and behaviors. Three sections were taken from the fall and spring interviews. Appendix A is titled “Child’s Health and Well-Being” and is part of the fall parent questionnaire. Because more children joined the sample in the spring of 1999, these questions were replicated later in the Spring Parent Questionnaire under “Supplementary Items for Non-Response Households” as seen in Appendix B. The section entitled “Home environment, activities, and cognitive stimulation” or HEQ, Appendix C, was also used in this study. The portion of these questionnaires selected, “Child’s Health and Well-Being” and “Home environment, activities and cognitive stimulation”, map the questionnaires directly to the research questions offering a list of the supports utilized by families. These three instruments serve as the foundation of the study by identifying the network created between supports.

In addition to an identification of the network created between supports, certain demographic information is critical to the guiding research questions. Students must first be identified as having access to special education programming. The school record abstract, Appendix D, was filled out by school staff and addressed the child’s attendance record, report card, IEP status and primary languages. This section also asks whether or not the child participated in Head Start prior to Kindergarten. Head Start will serve as a formal support in the network, which will be used to address the guiding research questions.

Throughout the literature on the importance of supports for students with access to special education programs, the location of the school is introduced as a critical factor impacting family’s access to supports. One way to see the differences in supports utilized

by families in different locations is by visualizing and measuring the networks created for varying locations. Identifying the different locations of the school students selected for this study attends addresses the third research question: How do the different measures of centrality, strength of ties and density vary through different populations in the data set. The school administrator questionnaire was filled out by the primary school administrator or a designee and addresses questions about the school, student body, school and administration policies. Of the nine sections in this questionnaire, only section “III. Community Characteristics and School Safety”, Appendix E, is used.

3.1.2 Network Variables

The following table, created from the instruments detailed above, gives the name of the variable, an abbreviated version of the question asked and the original location of the question. These variables will be used first to identify the target population for the study and then to create the support network. Both variables pertaining to informal and formal supports are identified. The variable name indicates the variable as it is identified through NCES. The question listed is a simplified version of the question asked on the specific instrument.

The majority of items originate in the fall parent interview and the spring parent interview. Specifically, items were identified are questions asked to parents about their child’s use of formal and informal supports. For the ECLS-K questions regarding specific services for children identified as having a disability and taking place before kindergarten are identified as formal supports. Examples of these include: speech or language therapy, occupational therapy, and physical therapy. Items identified as informal supports include

student's use of supports and activities outside the formal heading of special education. These include art classes, visiting a museum and organized athletic events.

In addition to formal and informal supports, three other interviews were used for basic demographic information for the students. The student records abstract will be used to identify whether or not the child has an IEP on file, whether or not they attended Head Start and the most current classification of the student's disability. Disability categories used on the ECLS-K are: learning disability, serious emotional disturbance, speech or language impaired, mental retardation, visual impaired (blind), hearing impaired (deaf), health impaired, physically impaired, multiple impairments, deaf and blind, developmental delay, autism, traumatic brain injury and other.

The fall administrator's interview was used to collect information on location of school, in terms of size of city in which the school is located. Each school is given a rating, on a specified scale: 1=large city, 2=Mid-size city, 3=Large suburb, 4=Mid-size suburb, 5=Large town, 6=Small town, 7=Rural.

Table 3.1

Network Variables

Variable Name	Question	Instrument
U1RIEP	Child has an IEP on file	Student Records Abstract Form
EU1RDIS	Primary Learning Disability from IEP	Student Records Abstract Form
EU1RHS	Did child attend Head Start before entering Kindergarten	Student Records Abstract Form
S1	School Location	School Administrator Questionnaire
CHQ340	Student received therapy services or taken part in a program for children with disabilities	Fall Parent Questionnaire
CHQ345A	Prior to Kindergarten: speech or language therapy	Fall Parent Questionnaire
CHQ345B	Prior to Kindergarten: occupational therapy	Fall Parent Questionnaire
CHQ345C	Prior to Kindergarten: physical therapy	Fall Parent Questionnaire
CHQ345D	Prior to Kindergarten: vision services	Fall Parent Questionnaire
CHQ345E	Prior to Kindergarten: social work services	Fall Parent Questionnaire
CHQ345F	Prior to Kindergarten: psychological services	Fall Parent Questionnaire
CHQ345G	Prior to Kindergarten: home visit	Fall Parent Questionnaire

Table 3.1 (continued)

Network Variables

Variable Name	Question	Instrument
CHQ345H	Prior to Kindergarten: parent support or training	Fall Parent Questionnaire
CHQ345I	Prior to Kindergarten: special class with other children with special needs	Fall Parent Questionnaire
CHQ345J	Prior to Kindergarten: private tutoring or schooling for learning problems	Fall Parent Questionnaire
CHQ345K	Prior to Kindergarten: introduction to Braille	Fall Parent Questionnaire
CHQ345L	Prior to Kindergarten: sign language	Fall Parent Questionnaire
HEQ100	Has your child visited a library	Spring Parent Questionnaire
HEQ130	Play, concert of live show	Spring Parent Questionnaire
HEQ140	Art gallery	Spring Parent Questionnaire
HEQ180	Athletic or sporting event	Spring Parent Questionnaire
HEQ300	Dance lessons	Spring Parent Questionnaire
HEQ310	Organized athletic events	Spring Parent Questionnaire
HEQ320	Organized clubs	Spring Parent Questionnaire
HEQ330	Music lessons	Spring Parent Questionnaire
HEQ340	Drama	Spring Parent Questionnaire
HEQ350	Art lessons	Spring Parent Questionnaire
HEQ370	Performing arts	Spring Parent Questionnaire

Table 3.1 (continued)

Network Variables

Variable Name	Question	Instrument
HEQ380	Crafts lessons	Spring Parent Questionnaire
HEQ390	Non-English classes	Spring Parent Questionnaire
SPQ120A	Prior to Kindergarten: speech or language therapy	Spring Parent Questionnaire
SPQ12OB	Prior to Kindergarten: occupational therapy	Spring Parent Questionnaire
SPQ12OC	Prior to Kindergarten: physical therapy	Spring Parent Questionnaire
SPQ12OD	Prior to Kindergarten: vision services	Spring Parent Questionnaire
SPQ12OE	Prior to Kindergarten: social work services	Spring Parent Questionnaire
SPQ12OF	Prior to Kindergarten: psychological services	Spring Parent Questionnaire
SPQ120G	Prior to Kindergarten: home visit	Spring Parent Questionnaire
SPQ120H	Prior to Kindergarten: parent support or training	Spring Parent Questionnaire
SPQ120I	Prior to Kindergarten: special class with other children with special needs	Spring Parent Questionnaire
SPQ120J	Prior to Kindergarten: private tutoring for learning problems	Spring Parent Questionnaire
SPQ120K	Prior to Kindergarten: introduction to Braille	Spring Parent Questionnaire
SPQ120L	Prior to Kindergarten: sign	Spring Parent Questionnaire

3.2 Data Analysis

This section serves as a detailed look into the network analysis to be executed in this study. A section on defining network terms and a list of statistical formulas are included to aid readers in the language of social network analysis. The conceptual model, an identification of the support network coupled with Bronfenbrenner's ecological model for human are introduced as well as the quantitative methods used to evaluate the network.

3.2.1 Network Terms and Definitions.

Social network analysis is comprised of distinct terminology to identify, persons, groups and structures within the network. Terms used throughout this proposal are defined as follows:

1. Node: also defined as actors, vertices or edges. Can be individuals, such as people within an organization or groups or individuals. For this study, the nodes will indicate students on an individual level and the supports utilized on a group level.
2. Tie: an indication between two nodes or groups of nodes. For this study, on the individual level, a tie will exist between a student and a support if the student utilizes the support. On the group level, a tie will exist between two supports if they have mutual members.
3. Strength of ties: refers to the extent to which the tie exists. Indicated by a discrete numerical value. For this study, the strength of the tie between two supports indicates the number of mutual members that utilize the supports.
4. Centrality: refers to a family of structural concepts relating to a node's position in the network. Centrality is a measure of how network structure and position

contributes to a person's importance. Measures of centrality that will be used in this study are freeman degree, betweenness, eigenvector and closeness which will be discussed later.

5. Density: A measure of the saturation of the network. In other words, a measure of the possible ties compared to the realized ties.
6. Network Mapping: A visual representation of the network created through social network analysis. This mapping should only be interpreted in relationship to the context of the network.
7. 2-mode Adjacency Matrix: The square matrix indicating whether or not ties exist between each node. For this matrix, the columns and the rows are different sets of entities. For example, in this study, the rows indicate the students identified for the study and the columns indicate the different support systems identified in the ECLS-K.
8. One-mode Adjacency Matrix: A matrix that exists when the rows and columns refer to the same set of entities. For example, in this study, the 2-mode adjacency matrix will be converted in to a one-mode weighted matrix, where both the columns and the rows indicate supports.

3.2.2 Statistical Formulas.

The following formulas are used as a quantitative measure of the aforementioned conceptual models. They can be performed on entire networks, subsets of networks and ego maps.

Degree Centrality: number of ties a given node has. The degree centrality of node *i* is: $d_i = \sum_j a_{ij}$.

Eigenvector Centrality: The eigenvector centrality of node *i* is $e_i = \lambda^{-1} \sum_j a_{ij} e_j$.

Closeness centrality: The closeness centrality of node *i*, where d_{ij} is the number of nodes in the shortest path between node *i* and *j* is: $c_i = \sum_j d_{ij}$.

Betweenness Centrality: The betweenness centrality of node *k*, where g_{ikj} =the number of shortest paths from node *i* to *j* is: $b_k = \sum_{ij} \frac{g_{ikj}}{g_{ij}}$.

The following formula is used to symmetrize the data sets.

Transform>Symmetrize (Sum): changes an unsymmetric matrix into a symmetric matrix.

Replace x_{ij} and x_{ji} with the sum of x_{ij} and x_{ji} .

3.2.3 Analysis.

The ECLS-K, base year file, is a large dataset encompassing several CD-ROM disks and it's own data extraction software. In order to address the guiding research questions, data must first be extracted from the ECLS-K Restricted-Use Base Year data files. Only the variables identified to address the guiding research questions will be extracted into an SPSS data file for analysis. Once appropriate data have been extracted, the sample of students with an IEP on file will be selected because only those students with access to special education programs are used in this study. SPSS will be used to calculate the frequencies of the supports used by families to answer the first research

question. All responses coded as “not applicable”, “refused”, “don’t know” and “not ascertained” will be coded as system missing. These frequencies will also guide the creation of network matrices.

SNA is characterized by a distinct methodology for data collection, statistical analysis, and visual representation. These techniques include using spreadsheets and network mappings to visually display connections between individuals or groups. In order to address the remaining guiding research questions the network must be identified, visualized and measured. In order to evaluate the network, data must be transferred from SPSS into two excel data files. To comply with ECLS team’s recommendations for weighting data, the appropriate weight will be employed at this time to ensure data the proper analysis and interpretation of the ECLS-K data. This will be done using the cross-tabs function in SPSS and identifying the weight used. The first data file, labeled a .vna file, will consist of the attributes of the supports and students in the ECLS-K data file. These attributes will be used in the analysis, in addition to the social network mappings, to distinguish formal and informal supports. Here Bronfenbrenner’s ecological model for human development will be used to distinguish different types of support and their relevancy to the child. This step will address the second research question visualizing the networks created based on Bronfenbrenner’s Ecological Model.

The second file will consist of network data from ECLS-K. This data file will be represented as a square matrix and will include all types of supports along both the first column and first row of the data set. A number will indicate the number of families who use both types of supports. Both data files will then be loaded into UCINET, a common social network analysis program (S.P. Borgatti, 2002)At this stage, UCINET’s

"symmetrize- addition" tool will be employed to make the spreadsheets symmetric. These files from UCINET can then be loaded into NetDraw, a program used to visualize social networks (S. P. Borgatti, 2002).

The primary component of the second guiding research question is a visual mapping of these networks. In order to address this question, and subsequent guiding research questions, social network analysis will be employed. As with traditional social network analysis, the networks in this study will consist of nodes and ties. For this networking example, the nodes will consist of the supports identified in ECLS-K. A tie will exist between two nodes, or supports, if one or more families identify that they use both types of support. Nodes are visualized as shapes on the network mapping, whereas ties are represented as lines between the nodes. The shape of the node may be determined by the type of support and the thickness of the tie will indicate the number of families who use the same supports. In the final symmetrized dataset, both rows and columns will consist of the supports in the dataset, where a number between two supports indicates number of mutual users.

3.2.4 Conceptual model.

The conceptual model used in this study is used primarily as a guide for the visual mappings created to address the second research question. Using the files from UCINET, maps will be made of the whole network, formal and informal networks separately, school location and according to Bronfenbrenner's ecological model for human development. Other maps may also be made using the strength of ties or other attributes identified in the original data file. Ego maps can also be created by examining single supports that are identified by the researcher in the quantitative analysis outlined below.

The following conceptual model gives examples of what these networks might look like from the guiding research questions. Combined with Bronfenbrenner's ecological model, social network analysis gives a visual representation to these networks that cannot be obtained through tradition techniques.

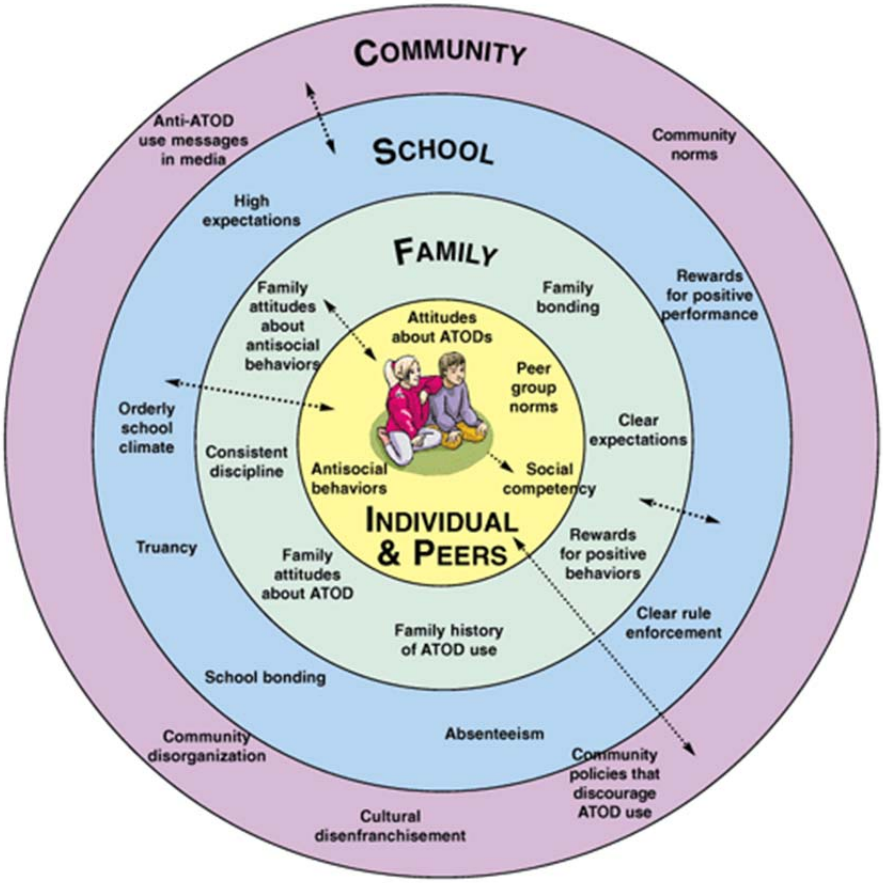

Figure 3.1

Bronfenbrenner's ecological model[1]

Bronfenbrenner's ecological can be more clearly represented through a social network mapping of all supports utilized by families of children with special needs. An abbreviated map of all the students and all the supports examined in the data set would

[1] Eisenmann JC, Gentile DA, Welk GJ, Callahan R, Strickland S, Walsh M, Walsh DA**:** SWITCH: rationale, design, and implementation of a community, school, and family-based intervention to modify behaviors related to childhood obesity.

look like Figure 7. Here the blue squares could represent formal supports, like federally mandated supports linked to special education. The red squares would then represent informal supports, such as day care or church groups. The thickness of the tie depicts how many common members the supports have.

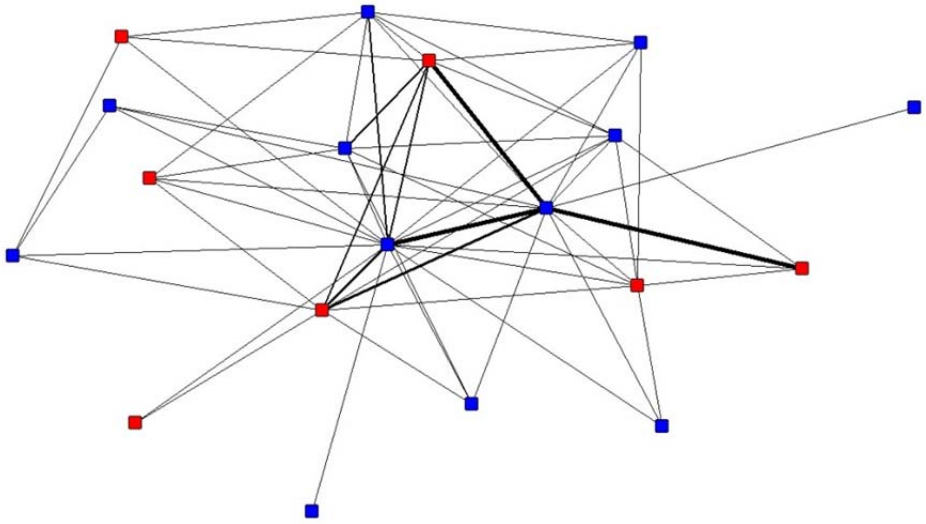

Figure 3.2

All students and supports

Bronfenbrenner's model could be used to define the distance between the center of the map and the supports. For example, points near to the center could be supports related to the microsystem of the child (peers, family and siblings). Points nearer to the outside of the map might represent those supports in the child's macrosystem. The shapes of the nodes could also change to show other characteristics of the supports (ie location, type of support, etc…)

In addition to whole network mappings, social network enables researchers to view specific groups or categories to view a different, more specific view of the network.

The following map can be made by looking at a specific group, here the blue nodes from below (informal support).

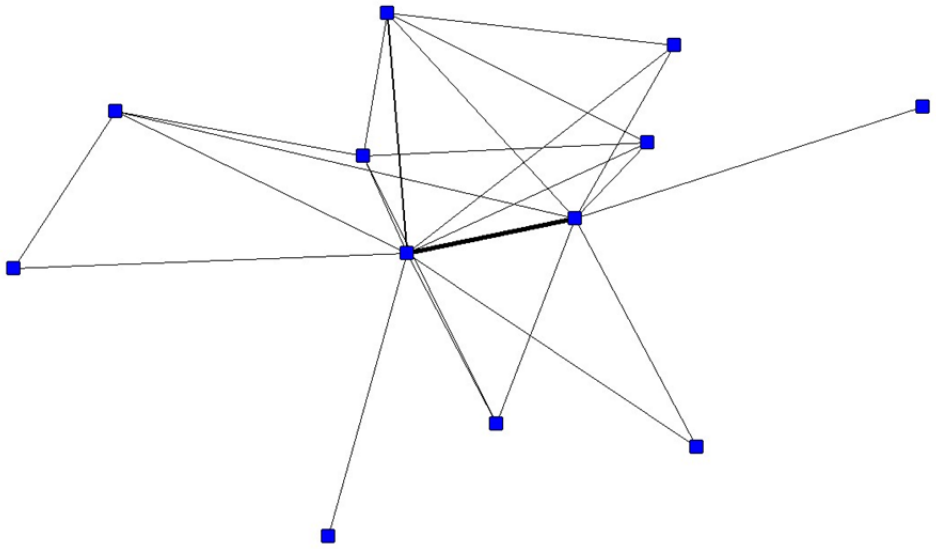

Figure 3.3

Map of specific type of support

Again, Bronfenbrenner's ecological model could be used to define the distance between the points. Now, only the supports that do not specifically apply to special education are depicted. Similar analysis can also be given to compare different groups to one another as well as to the entire network. NetDraw can also be used to look at specific populations, or any different characteristics loaded into the program.

To look at specific supports and those supports in which they share members, ego network maps can be created. Figure 9, shows only those supports who share common members with the clear node in the center of the map. This feature can be used to closely examine a specific support, such as Head Start. Quantitative analysis can be completed on ego networks, as well as whole networks and group's network maps.

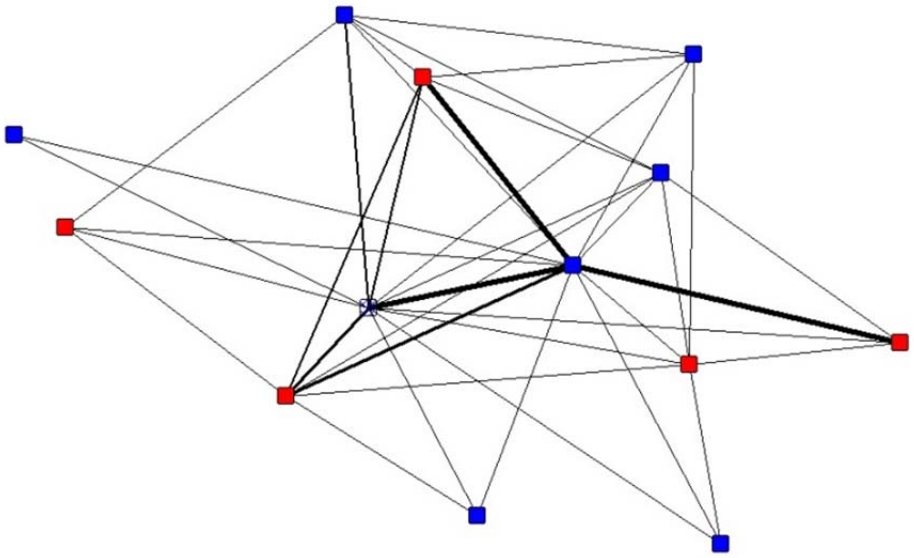

Figure 3.4

Map of single support and supports that share common members

3.2.5 Quantitative analysis.

Although network mappings do create a visual picture, the quantitative aspect of social network analysis is also useful for education research. Depending on the purpose of the study, UCINET has a wide variety of tools to use. More complicated techniques may require transferring UCINET data into traditional statistical packages. For this study, UCINET will be used to identify centrality and density of the networks. These quantitative findings will be used to address the third research question, comparing social network measures of differing networks.

The most practical use of social network analysis is to identify the most important or key players in a network. Centrality helps determine these key players. Centrality is truly the fundamental concept of social network analysis. Centrality has also been shown to be an effective tool in measuring 2-mode networks(Borgatti, 2005). Nodes with high

centrality are often identified by insiders as those “in the know”. Centrality, in this study, will identify the support systems that are literally in the center of the support network for children with disabilities. Being able to identify supports with high centrality, researchers may be able to identify intervention points for strategic change, or simply to identify which supports in the network have members that use other supports in the network. For this study, centrality will identify the supports used most frequently and those that they share the most members with.

This study will use degree, closeness, betweenness and eigenvector centrality to measure the network. Degree centrality is the simplest form of centrality. Degree centrality is a basic count of the number of ties a node has. Here a high level of degree centrality means a support shares members with many other supports. A support that shared very few members with other supports would have a very low level of degree centrality. This will be calculated using the Freeman Degree option in UCINET. The formula for degree centrality of a node *i* is: $d_i = \sum_j a_{ij}$.

Another type of centrality that will be employed in this study is closeness centrality. This measure refers to the number of ties between a node and all other nodes. The closeness centrality of node *i*, where d_{ij} is the number of nodes in the shortest path between node *i* and *j* is: $c_i = \sum_j d_{ij}$. It is often used as a measure of the length of time it takes for information to pass between a node and all other nodes. nCloseness is a standardized value on a scale from 0.0-1.0 where the higher the score the “closer” to all other nodes. For example, a support with ties to all other supports would have an nCloseness value of 1, whereas an isolate, a support without any members using other supports, would have an nCloseness value of 0.

Betweenness centrality is a measure of the number of times a node falls along the shortest path between two other nodes. The betweenness centrality of node *k*, where g_{ikj} =the number of shortest paths from node *i* to *j* is: $b_k = \sum_{ij} \frac{g_{ikj}}{g_{ij}}$. Betweenness centrality can be used as a measure of control within a network. The idea is that nodes with high betweenness centrality may have the ability to hinder or change information passed along them. A support with an nBetweenness score (standardized) of 0 would never be along the shortest path between two supports, whereas a support with an nBetweenness score of 1 would be along the shortest path between every other support.

Eigenvector centrality not only counts the number of nodes to which each node is connected, but also weights these nodes according to their centrality. The eigenvector centrality of node *i* is $e_i = \lambda^{-1} \sum_j a_{ij} e_j$. Essentially eigenvector centrality is a measure of how well connected the supports are to which each support is connected. It is often used as a measure of popularity in communication networks. For our study, eigenvector centrality will be used as a measure of the supports that share members with other popular supports. The higher the score of a support, ranging from 0.0-1.0, the better connected the supports to which it is connected.

Along with centrality, a common measure used in social network analysis is density. Network density, simply put, is the number of ties divided by the number of possible tie. Although it is unlikely for every support to be connected to every other support, density does give a measure of how saturated the network is. This network is expected to have some density, in that members usually use more than one support. Density is also calculated in Ucinet using the formula $\frac{n(n-1)}{2}$, where n is calculated relative to the number of unique pairs in the data set. Unlike centrality, which easily

adapts to network properties of 2-mode data, certain steps must be taken to ensure the proper measure is identified to measure density (Borgatti, Forthcoming). To adapt for this change, the denominator may be changed to $n_i n_o$, representing the number of actual edges in the undirected graph.

Another quantitative method used in social network analysis is that of strength of ties. Here strength will be determined by the number of shared members between two supports. On the map this will be represented as the thickness of the line between two types of supports. The thinner the line is, the fewer common members; the thicker the line is, the more common members. Additional density measures can then be used to evaluate a valued graph.

The final research question involves the use of quantitative findings, along with the visual mappings to describe the relationships between the support systems utilized. The final stage of this study will give insight about the population and policy implications using visual representations of the networks as well as the social network analyses of centrality, density and strength of ties.

3.3 Overview

While the first two chapters focused on the importance of support systems and the practicality of using social network analysis to evaluate these supports, this chapter lays out the actual methods that will be used in this study. In addition to giving definitions, statistical formulas, and information on the data set used in this analysis, this section offered a sound conceptual framework that will guide the analyses. Both network structure and quantitative analysis findings offer a practical, interpretable evaluation of the relationship between support systems for children with access to special education programs.

Chapter 4

Analysis and Results

This chapter presents the results of a social network analysis conducted to investigate the network created of formal and informal supports used by families of children with access to special education programming. A sample of 458 students were extracted from the ECLS-K base year dataset for the following criteria, 1) Student's must exist in the ECLS-K base year, restricted-use special education dataset and 2) have an IEP on file with the school according to the student record abstract. Results for the analysis include detailed frequencies of the disabilities of the students, formal and informal supports used and the distribution of locations represented in this sample, social network mappings of the supports and quantitative results based in social network analysis. The following questions guided the analyses:

1. What are the frequencies, types and categories of supports used by families of children who have access to special education programs?
2. What might social network mappings, of these supports and their common members look like and how might they relate to Bronfenbrenner's Ecological Model for human development?
3. How do the different measures of centrality, strength of ties and density vary through different populations in the data set?
4. What might the quantitative findings, using traditional social networking techniques described above, tell us about the population and policy implications?

To address the first question, frequency tables for student's main disability category, formal supports, informal supports and school location in terms of level of ruralicity. The

second and third questions relate directly to the networks created using a 2-mode matrix of students and supports and the subsequent network analyses. First general maps of the whole network, formal support network and informal network are presented. Following these network mappings, are a more detailed view of the network created by looking only at a specific disability category, then separating the map by level of ruralicity. A map is also presented based on Bronfenbrenner's Ecological Model for human development using the ECLS-K data. Along with network mappings, quantitative social network results are presented including measures of centrality for each mapping presented. The final question will be addressed throughout the results section.

4.1 Frequency Tables

Frequency tables to describe the data available in the sample sought to answer the first research question by describing the data available in the sample selected for this study. The frequency tables presented in this section include frequencies of student's main disability category, formal supports and school location in terms of ruralicity. The information presented in the following tables was calculated using SPSS. The first frequency table includes information on student's main disability categories. Disability categories included in the ECLS-K collected for the ECLS-K base year were: learning disability, serious emotional disturbance, speech or language impairment, mental retardation, deaf/hard of hearing, health impairment, physical impairment, multiple impairments, developmental delay, and autism. The following table summarizes the frequencies by which each of the disability categories was listed as the student's main disability category including an unknown category if the response was either system missing or not ascertained. The student's main disability was reported in 88.5% of the

sample. The highest main disability reported was speech or language impairment (53.5%). There were no students in the sample with their main disability category reported as blindness.

Table 4.1

Frequencies of Student's Main Disability Category

	Frequency	Percent (%)
Unknown	48	10.5
Learning Disability	52	11.4
Serious Emotional Disturbance	8	1.7
Speech or Language Impairment	245	53.5
Mental Retardation	15	3.3
Deaf/Hard of Hearing	6	1.3
Health Impairment	12	2.6
Physical Impairment	8	1.7
Multiple Impairments	16	3.5
Developmental Delay	37	8.1
Autism	11	2.4
Total	458	100.0

Table 4.2 summarizes the frequency of formal supports used by the families sampled in this sample from the ECLS-K. It is important to note that these categories are not mutually exclusive, meaning a student could, and often did, participate in several formal supports. The frequency category signifies the number of students, out of the 458

in the sample whose parents said they participated in the specific support. The percent represents the percent of students from the sample that used the support. Therefore, the percentages presented refer to the percent of the sample that used the selected support. For example, the highest used support was speech therapy. For students in this sample, 41.3% received speech or language therapy. Similarly, 24.5% of students were in a special class with other children some or all of who also had special needs. No students, in the selected sample received Braille instruction before school began.

Table 4.2

Formal Supports

	Frequency	Percent (%)
Speech Therapy	189	41.3
Occupational Therapy	90	19.7
Physical Therapy	68	14.8
Vision Services	26	5.7
Social Work Services	44	9.6
Psychological Services	48	10.5
Home Visits	57	12.4
Parent Support	57	12.4
Special Needs Classes	112	24.5
Private Tutoring	41	9.0
Braille Instruction	0	0
Sign Language Instruction	11	2.4

The following table summarizes the frequency of informal supports used by the families sampled in this sample from the ECLS-K. Similar to the table on frequencies of formal supports, the supports in this table are not mutually exclusive. This data came from two different surveys, the fall and spring parent surveys. Questions regarding informal supports were asked to all parents, regardless of their child's access to special education programs. All parents were asked in the fall questionnaire. Only those that did not have responses from the fall questionnaire were included in the spring supplementary

questions. Data were combined using SPSS. The frequencies listed all refer to the number of students whose parents reported the use of the indicated support for their child that had access to special education programs. For informal supports the most commonly utilized support was participation in a cultural event (49%) followed by visiting the library (44.1%). The lowest participation in informal supports occurred with taking drama classes (1.1%).

Table 4.3

Frequencies of Informal Supports

	Frequency	Percent (%)
Library	202	44.1
Play	134	29.3
Museum	89	19.4
Zoo	155	33.8
Observed Sport	161	35.2
Dance Lessons	21	4.6
Participate in Sport	148	32.3
Club	47	10.3
Music Lessons	16	3.5
Drama Classes	5	1.1
Art Lessons	18	3.9
Participate in Perf. Arts	44	9.6
Craft Classes	24	5.2
Non-English Instruction	17	3.7
Cultural Event	220	49.0

In addition to the main disability categories and the supports used by families of student's with access to special education programs, the following table was used to illustrate the differences in locations represented in the sample selected for this study. The school administrator filled out this specific portion of the survey referring to the

community in which the school the student attends is located. The largest portion of students attended a school referred to as a large suburb (31%). This frequency table is presented to illustrate the vast differences in community sizes for students in this sample. The majority of students (62.7%) attend a school that is either located in a large city, mid-sized city or large suburb. One of the benefits of social network analysis, is the ability to pull out the smaller categories, such as rural/small town communities to exam the network created specifically in these communities so that it is not essentially "washed out" due to the frequency of larger communities.

Table 4.4

Frequencies of Location Type in Sample Frame

	Frequency	Percent (%)
Large City	59	12.9
Mid-Size City	86	18.8
Large Suburb	142	31.0
Mid-Size Suburb	30	6.0
Large Town	24	5.2
Small Town	52	11.4
Rural	64	14.0
Missing	1	0.2
Total	458	100.0

Tables 4.2 and 4.3 have demonstrated the types and categories of supports used by families of children who have access to special education programs. The student's main disability category as well as the location of the school was also presented in tables 4.1 and 4.4. The following section will move from descriptive analyses into social network mappings and analyses.

4.2 Social Network Mappings

The sociogram, or network mapping, gives a physical representation of the data from a social network consisting of actors and ties (Hanneman and Riddle 2005). Graph theoretical concepts are a foundational and critical component to understanding, visualizing and interpreting social network models. From the beginning, Moreno (1934) and Harary (1959) developed the use of graphs as a means to visually represent social networks. For special education practitioners, eco-mapping serves a similar purpose, to create a visual representation of a network that easily interpreted and used by a wide variety of audiences. This section serves to examine the visual representation, through a social network mapping, of the supports used by families with children that have access to special education programs. The entire network map created using the selected sample from the ECLS-K dataset, as well as more specific mappings of formal in informal supports. A visual mapping of a specific subset of the population is mapped, and displayed by level of ruralicity. Finally, a social network map, based on the principles of Bronfenbrenner's ecological model for human development is presented.

Before social network maps were created, data were first transformed from 2-mode to 1-mode matrices. These 1-mode matrices are created using Ucinet's Data>affiliation tool with the columns, or supports, as the new 1-mode matrix. The

original dataset used in this study, as extracted from the ECLS-K data consisted of students x supports. The matrix used to create these mappings consisted was essentially a cross-tabulation of supports, and used the affiliation tool to create a support x support, 1-mode matrix. Figure 4.1 is the 1-mode matrix created in Ucinet for the whole network map. Each mapping has it's own correlating matrix and is found in Appendix G. The diagonals of Figure 4.1 directly correlate with the frequency tables 3.2 and 3.3. For example, the cross of Library x Library is 202, meaning a 202 students went to the library. The cross of different supports, such as Library x Play is 69, meaning 69 students in the sample used the library and went to a play.

For each mapping presented, several components remain the same. For these mappings, each support, or node, is represented as a circle or square. Blue squares represent formal supports and red circles represent informal supports. A line between two supports indicates that at least one person uses both supports. The thickness of the line denotes the strength of the tie on a scale of 1-4. Supports with a thicker tie are said to have a stronger tie, meaning more people use both supports. Similarly, a thinner line denotes a weaker tie, meaning fewer people use both supports.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	Library	202	69	59	90	94	16	86	25	10	5	12	32	15	8	120	88	33	24	8	14	22	19	28	49	18	3	11	41	
2	Play	69	134	34	71	69	9	51	15	8	4	12	16	12	14	73	59	27	21	10	14	16	15	16	36	15	6	2	31	
3	Museum	59	34	89	45	33	6	39	13	7	1	4	14	9	3	56	38	21	17	6	11	12	10	12	25	10	1	3	19	
4	Zoo	90	71	45	155	72	10	61	16	9	4	10	16	11	7	97	62	33	24	8	14	14	16	16	37	17	4	5	27	
5	Observed_Sport	94	69	33	72	161	9	79	16	13	3	8	20	11	4	93	79	30	20	11	15	20	21	26	42	18	0	5	8	28
6	DanceLessons	16	9	6	10	9	21	17	7	2	2	2	7	3	1	10	9	2	1	0	0	1	1	2	3	1	0	0	1	2
7	Participate_in_Sport	86	51	39	61	79	17	148	22	11	4	12	24	16	4	84	63	26	15	6	11	15	15	18	35	12	0	4	7	17
8	Club	25	15	13	16	16	7	22	47	3	3	1	7	5	1	25	18	9	7	2	5	1	4	7	12	2	0	1	1	11
9	Music_Lessons	10	8	7	9	13	2	11	3	16	0	4	4	4	1	9	4	2	2	1	1	1	1	2	3	2	0	1	2	1
10	Drama_Classes	5	4	1	4	3	2	4	3	0	5	0	2	1	1	3	2	2	1	0	0	1	1	0	2	0	0	0	1	0
11	Art_Lessons	12	12	4	10	8	2	12	1	4	0	18	4	6	3	13	9	3	3	2	3	4	3	3	8	4	0	2	1	3
12	Participate_in_Orga	32	16	14	16	20	7	24	7	4	2	4	44	10	2	29	16	8	6	6	6	6	3	4	11	3	0	1	3	9
13	Craft_Classes	15	15	9	11	11	3	16	5	4	1	6	10	24	3	16	10	4	3	5	3	4	1	5	7	2	0	1	2	2
14	Nonenglish_Instruc	8	7	3	7	4	1	4	1	1	1	3	2	3	17	13	8	6	4	2	3	4	2	1	7	3	0	3	0	2
15	Cultural_Event	120	73	56	97	93	10	84	25	9	3	13	29	16	13	220	88	45	33	15	24	29	26	34	59	21	0	8	9	41
16	Speech	88	59	38	62	79	9	63	18	4	2	9	16	10	8	88	189	87	63	26	40	43	55	54	108	40	0	11	21	46
17	Occupational	33	27	21	33	30	2	26	9	2	2	3	8	4	6	45	87	90	58	18	29	26	36	37	75	26	0	8	7	19
18	Physical	24	21	17	24	20	1	15	7	2	1	3	6	3	4	33	63	58	68	15	27	20	38	33	52	20	0	6	7	13
19	Vision	8	10	6	8	11	0	6	2	1	0	2	6	5	2	15	26	18	15	26	13	9	13	13	18	7	0	2	3	6
20	Socialwork	14	14	11	14	15	0	11	5	1	0	3	6	3	3	24	40	29	27	13	44	25	25	26	27	13	0	4	6	12
21	Psychological	22	16	12	14	20	1	15	1	1	1	4	6	4	4	29	43	26	20	9	25	48	21	23	30	13	0	4	5	11
22	Homevisits	19	15	10	16	21	1	15	4	1	1	3	3	1	2	26	55	36	38	13	25	21	57	30	40	16	0	4	8	19
23	Parentsupport	28	16	12	16	26	2	18	7	2	0	3	4	5	1	34	54	37	33	13	26	23	30	57	38	13	0	3	6	15
24	Specialneedsclass	49	36	25	37	42	3	35	12	3	2	8	11	7	7	59	108	75	52	18	27	30	40	38	112	34	0	10	6	28
25	Tutoring	18	15	10	17	18	1	12	2	2	0	4	3	2	3	21	40	26	20	7	13	13	16	13	34	41	0	7	4	6
26	Braille	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	Signlanguage	3	6	1	4	5	0	4	1	1	0	2	1	1	3	8	11	8	6	2	4	4	4	3	10	7	0	11	1	2
28	Other_Therapy	11	2	3	5	8	1	7	1	2	1	1	3	2	0	9	21	7	7	3	6	5	8	6	6	4	0	1	23	0
29	Head_Start	41	31	19	27	28	2	17	11	1	0	3	9	2	2	41	46	19	13	6	12	11	19	15	28	6	0	2	0	108

Figure 4.1 Affiliation matrix for whole network

4.2.1 Whole network mapping.

The network mapping for the entire sample in this study includes the ties, or similar supports, for all students included in the sample. The result is a very crowded mapping that displays a high level of network activity, as displayed in the number and strength of the ties. One feature of the software package NetDraw, the network visualization software package used in this study is the multiple ways in which NetDraw can arrange the nodes in a network. Multi-Dimensional Scaling includes a family of techniques that are used frequently in social network analysis to arrange nodes by similarity. Nodes are considered "similar" if they have similar shortest paths to all other nodes (Hanneman & Riddle 2005). The maps in this chapter are all presented using Multi-Dimensional Scaling techniques for both consistency and interpretability.

Figure 4.2 displays the entire network created by the supports used by all students in the selected sample. This initial network is very crowded and may be difficult to interpret. However, this map does indicate that a network does exist between different types of supports and that differences occur, with regards to strength of ties, between different supports. The next step in network visualization is to essentially pull the network apart, looking at two subsets of supports.

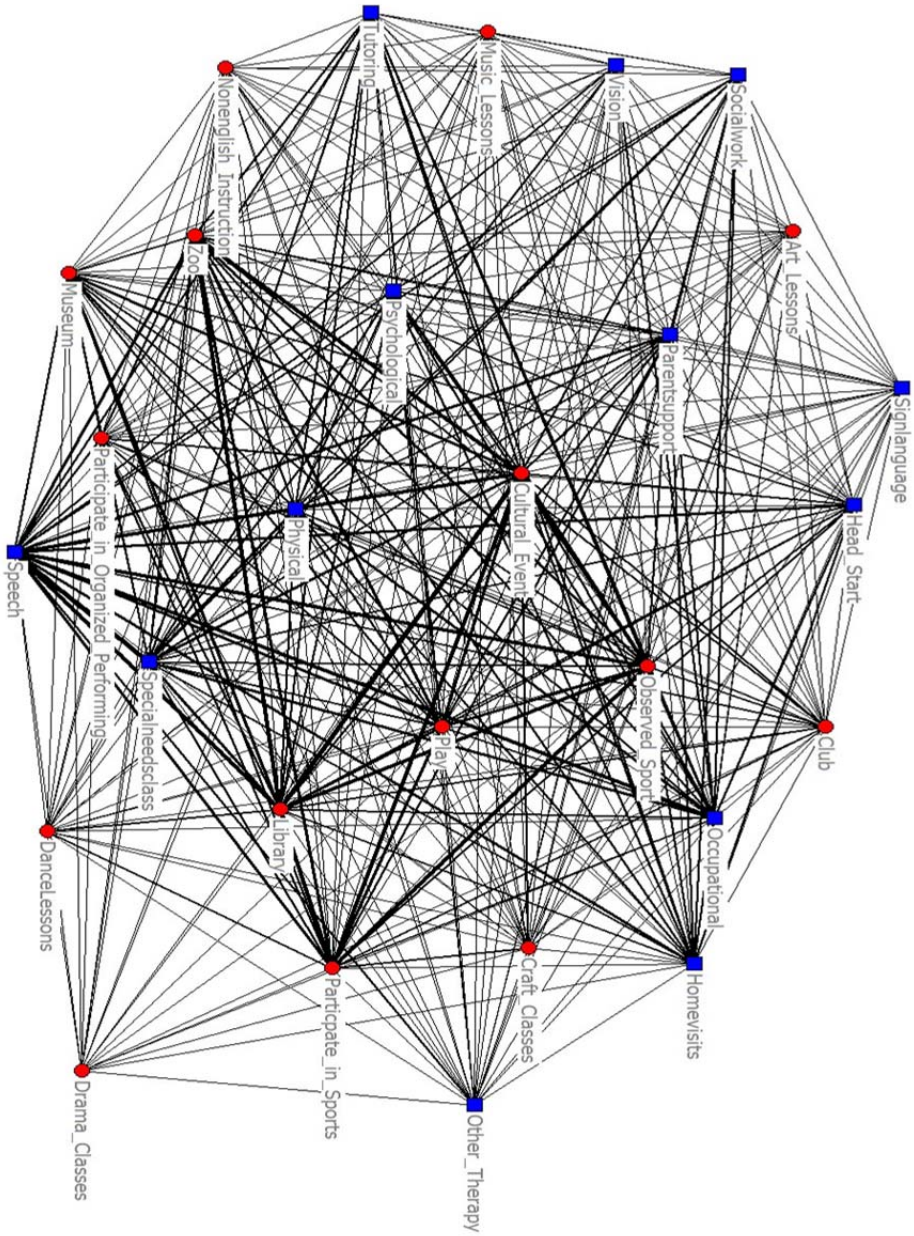

Figure 4.2

Whole network

4.2.2 Formal and informal networks.

Another way to visualize a network mapping is to pull out a selected group of nodes and compare the network structure of different groups of nodes. The supports selected for this study from the ECLS-K lend themselves easily to two exclusive categories: formal and informal supports. The following two network mappings are the visual displays of formal and informal supports pulled out from the original whole network. The matrices used to create the following figures are found in Appendix F. The formal network for this study consists of the supports used by families that relate directly to special education services. Some examples of these supports from the ECLS-K dataset include speech or language therapy and special classes. The informal support network includes all supports that are not specific to special education. Examples of these informal supports found in the ECLS-K dataset include visiting a library or taking music classes. The following figures are visual representations of the networks created by formal and informal networks.

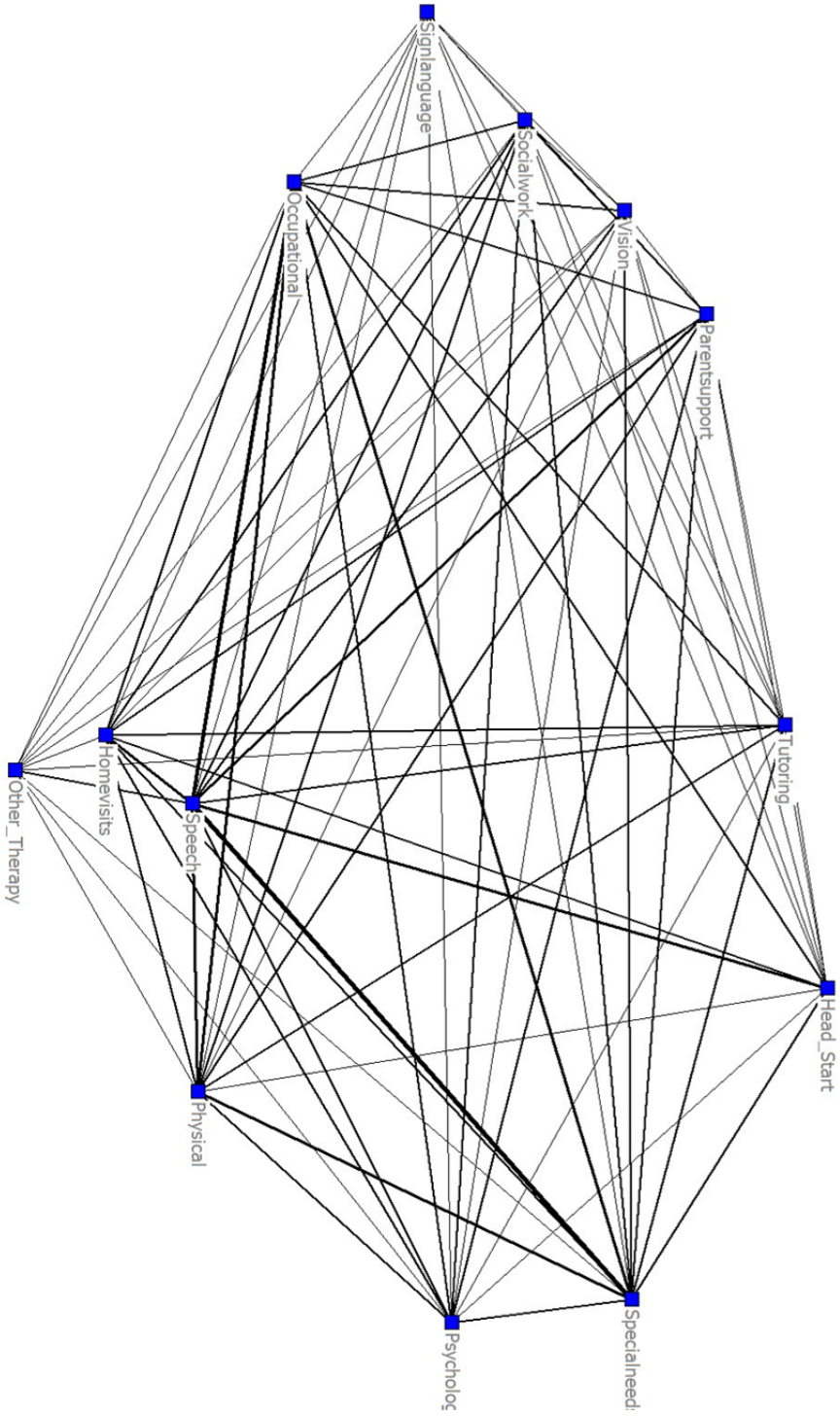

Figure 4.3

Formal supports

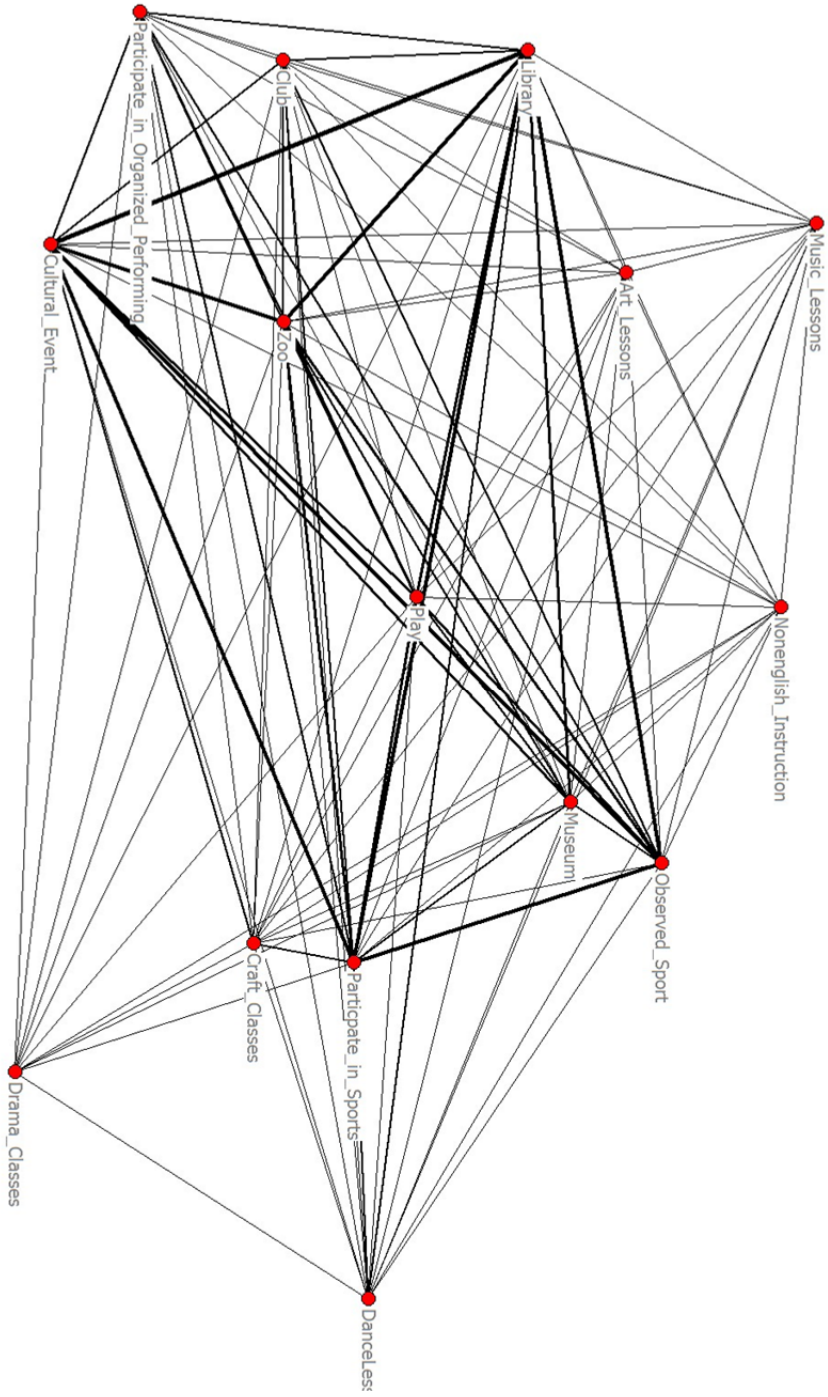

Figure 4.4

Informal supports

Figures 4.3 and 4.4 represent all the supports used in this study, separated into formal and informal supports. The nodes were pulled directly from the original, whole network mapping, therefore the placement of the nodes as well as the strength of ties are the same as in the original mapping. Some key similarities between these maps include the high level of network activity, as evidenced through the number of lines throughout the networks. The strength of ties also varies throughout both datasets, indicating that some supports are used more frequently in conjunction with other supports.

Despite these similarities, there is an inherent difference in the network structure of the formal and informal networks presented. Because of the multidimensional scaling techniques used for the placement of nodes in the formal network, nodes that are more connected are placed more centrally in the network than those that are less connected. The nodes in Figure 4.3, the formal network, are almost all along the periphery of the network, indicating that the formal supports are the least similar to one another and to informal supports. Contrasting figures 4.3 and 4.4, the placements of the supports in the informal support mapping are much closer together, indicating that ties between these supports are more similar.

4.2.3 Specific disabilities and ruralicity

Although maps that examine formal and informal supports for all students are useful I evaluating the structure of the support network, they do not give any visual representation to specific disabilities or the ruralicity variable. From a methodological standpoint, mappings of specific disabilities and school locations offer a clearer, more unobstructed view of the support network for specific populations. From a policy view, the ability to pull out specific groups of individuals with defined characteristics, can

provide an in depth view of the need for education policy as well as serving as an evaluation of current policy issues related to special education supports.

As a demonstration of the ability of social network analysis for this specific population, social network mappings are presented for one specific main disability category for three different levels of ruralicity. For this part of the study, explorations of the networks created by the supports used by families with children with learning disabilities are presented. In the sample selected for this study, 52 out of 458 student's school record abstracts identified their main disability category as learning disability. Figure 4.5 is the social network mapping of the supports used by this subset of the study sample.

Table 4.5

Frequencies of Location Type for Students with Learning Disabilities

	Frequency	Percent (%)
Urban	16	30.8
Suburban	21	40.4
Rural	15	28.8
Total	52	100.0

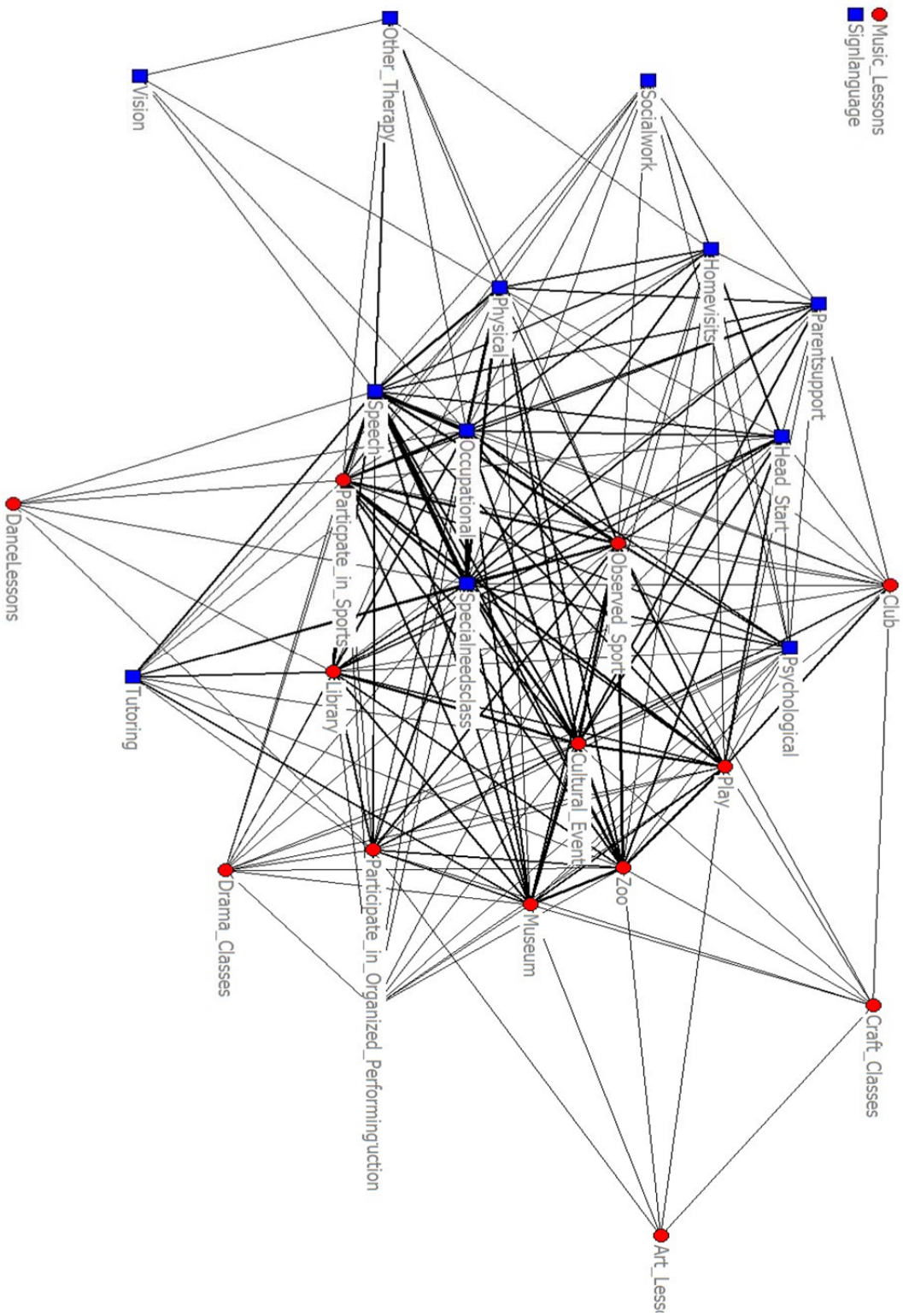

Figure 4.5

Learning Disability Network

Figure 4.5 gives a clearer, more interpretable picture of the network of support systems for children whose main disability category is learning disability. Two specific supports, sign language and music lessons were not used by the children in this specific sample, as evidenced by the isolate nodes located in the top left-hand corner of the mapping. There are many lines connecting different supports as well as varying degree of thickness of these lines. There fore there is a high level of network activity for this specific disability category, as well as varying strength of ties.

Network mappings for all main disability categories are presented in Appendix G.

Similar to previous mappings, where specific groups were pulled out and displayed in their own mapping, network mappings can also be created based properties of the individuals from the 2-mode network mappings. One variable emphasized in the literature to have an affect access to supports is ruralicity. Here, ruralicity is simply defined as the school location, as selected in the School Administrator Survey from the ECLS-K. There were seven different school locations administrators could identify their school with: Large city, midsized city, large suburb, mid-size suburb, large town, small town, rural. For practical purposes, categories of schools were combined into 3 categories. For the purposes of this study, they were defined as rural (Rural and Small Town), suburb (mid-size suburb and large suburb), and urban (mid-size city and large city). No students' schools in this subset were located in large towns. Table 4.5 gives the frequency of occurrence of these school locations for individuals whose main disability category was learning disability.

All students with their main disability category defined as learning disabilities, included data on the location of their school. Using Ucinet and NetDraw, 1-mode network maps of the students' supports were created using the three levels of ruralicity as a filter variable.

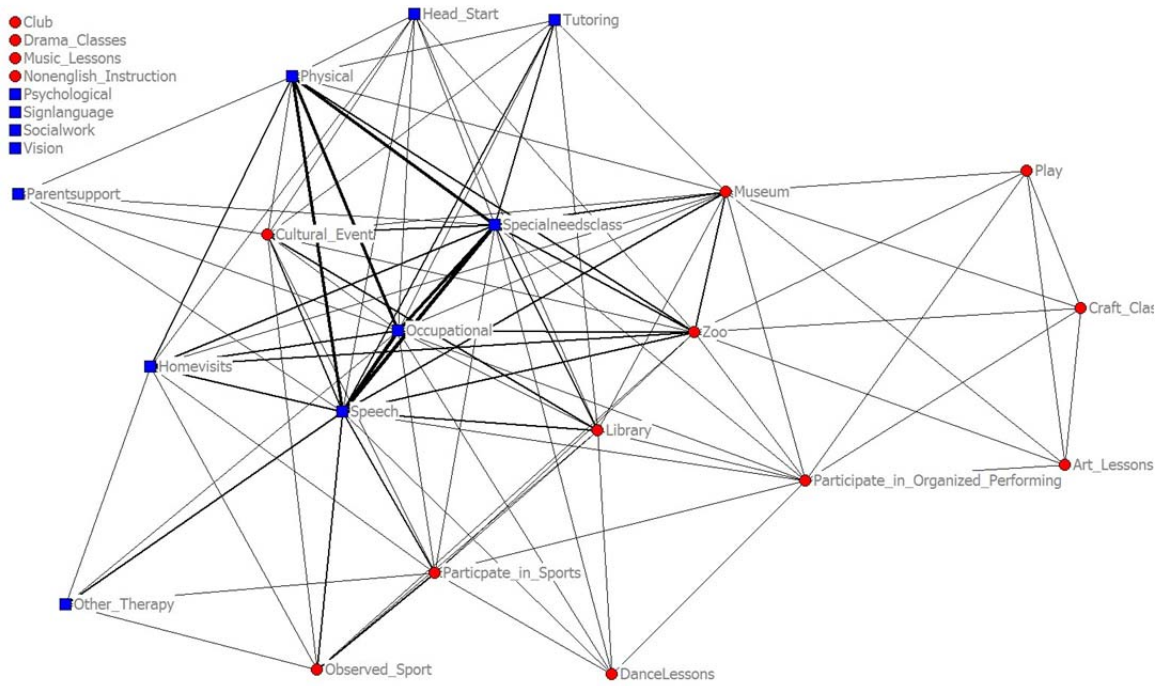

Figure 4.6

Support Network for Urban Students with Learning Disabilities

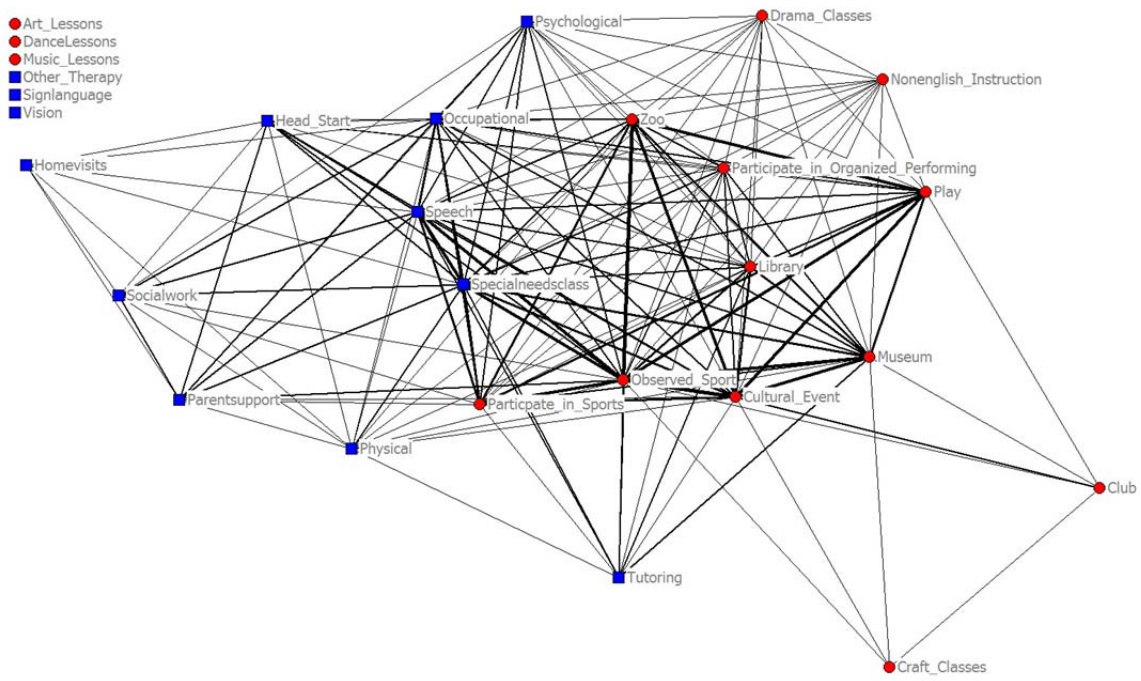

Figure 4.7

Support Network for Suburban Students with Learning Disabilities

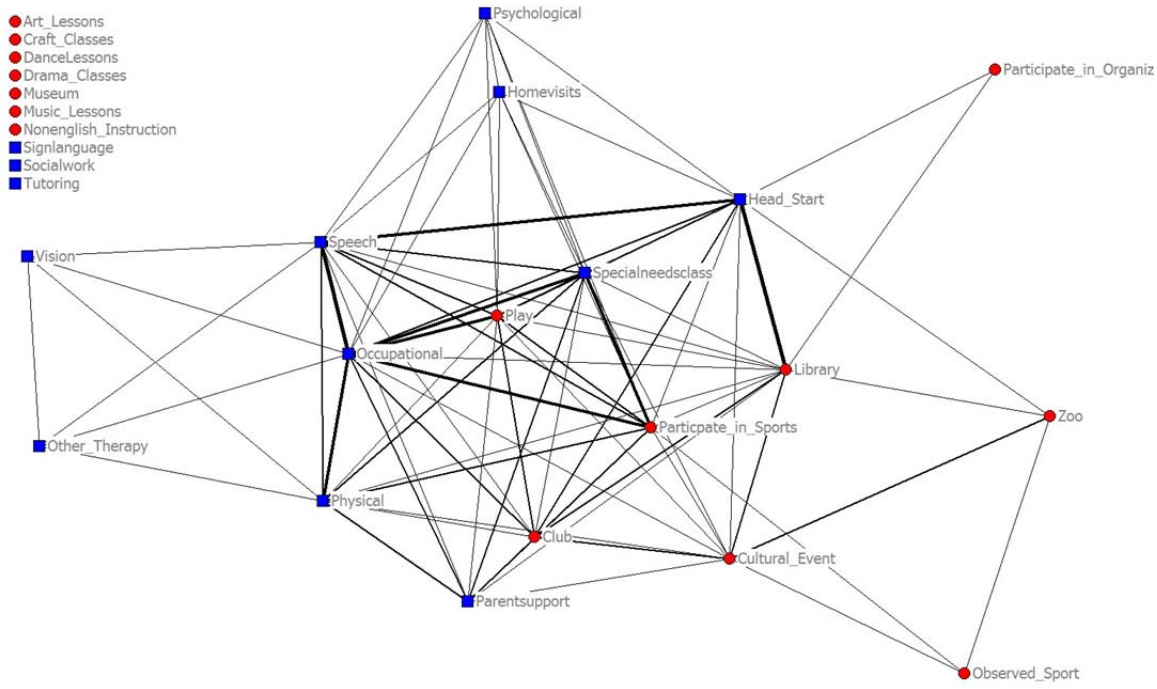

Figure 4.8

Support Network for Rural Students with Learning Disabilities

Figures 4.6, 4.7 and 4.8 are visual mappings of the support networks created by students whose main disability category was listed as learning disability on their school record abstract. Although the number of students represented in each subsample varies slightly, differences in network structure are very apparent. Nodes located in the top left-hand corner of each map are supports that were not used by students in each subsample, and the shape and color of each support indicates whether the support is defined as a formal or informal support. Similar to previous mappings, the locations of the supports in the mappings are defined by Multi-Dimensional Scaling techniques. Therefore, if the supports used by students with the same disability were constant among all levels of ruralicity, the location of each support on the mapping would be constant. For example, students whose school location is identified as small town or rural use fewer supports, as evidenced by the greater number of isolate nodes in the top left hand corner. However, the majority of the supports that they are not utilizing are defined as informal supports. In addition to nodes isolated in the support network, the placement of individual supports in the dataset should be consistent throughout the different levels of ruralicity, if supports were used the same in different school locations. These same visual mappings can be made for any level of ruralicty and any main disability category as defined in the dataset.

4.2.4 Bronfenbrenner's Ecological Model.

Network mappings representing the whole network, informal supports, formal supports, individual primarily disability supports and level of ruralicity have been presented. The final network mapping presented is in response to Bronfenbrenner's ecological model for human development. Due to the size of the network, the large number of connections in the network, and the supports listed in the dataset, a network

mapping based strictly on Bronfenbrenner's model is not possible. However, a model based on the level of usage of each support, grounded in Brongenbrenner's theoretical model is possible and can help policy makers gain insight into not only the theoretical framework but also the actual usage of supports for students with access to special education programs.

Ecological systems theory is based upon another visual display, in which a child's world is represented through a series of overlapping circles. The circles closest to the child include the individual and peers, then family and so forth. In other words, the resources most central to the child are placed closer in the model. Consider the previous support networks and the relationships between the supports. In the former network mappings, supports were placed on the map based on their similarity to other supports. However, if the placement of these supports was changed and they were placed not by their relationship to one another, but by their number of connections, this map could then be compared to Bronfenbrenner's ecological model. Ties with more connections are used in more frequently with other supports; therefore they may be more central in usage in the network mapping. Degree centrality, a measure of the number of ties in which a node is connected (Freeman 1979) is one way to visualize the connections of a node.

Figure 4.8 and 4.9 are visual mappings of the whole network, where the placement of the nodes, as well as the size of the nodes is a reflection of their degree centrality. The higher the supports centrality, the closer to the center of the network the support is placed. Similarly, the higher the degree centrality measure of the support, the larger the node. The full descripting of degree centrality measures is discussed in the following section. This graph was modified in NetDraw and serves as a network model

based within the framework of Bronfenbrenner's ecological model. Both network mappings include the exact same data and node placement, however, in figure 4.9, the network lines have been removed, and circles representing the concentric circles found Bronfenbrenner's ecological model have been added. The result of these mappings, are a clearer view of the relationships between the supports, as measured by their degree centrality. The following network mappings are a visual representation of the networks arranged by the support's levels of degree centrality.

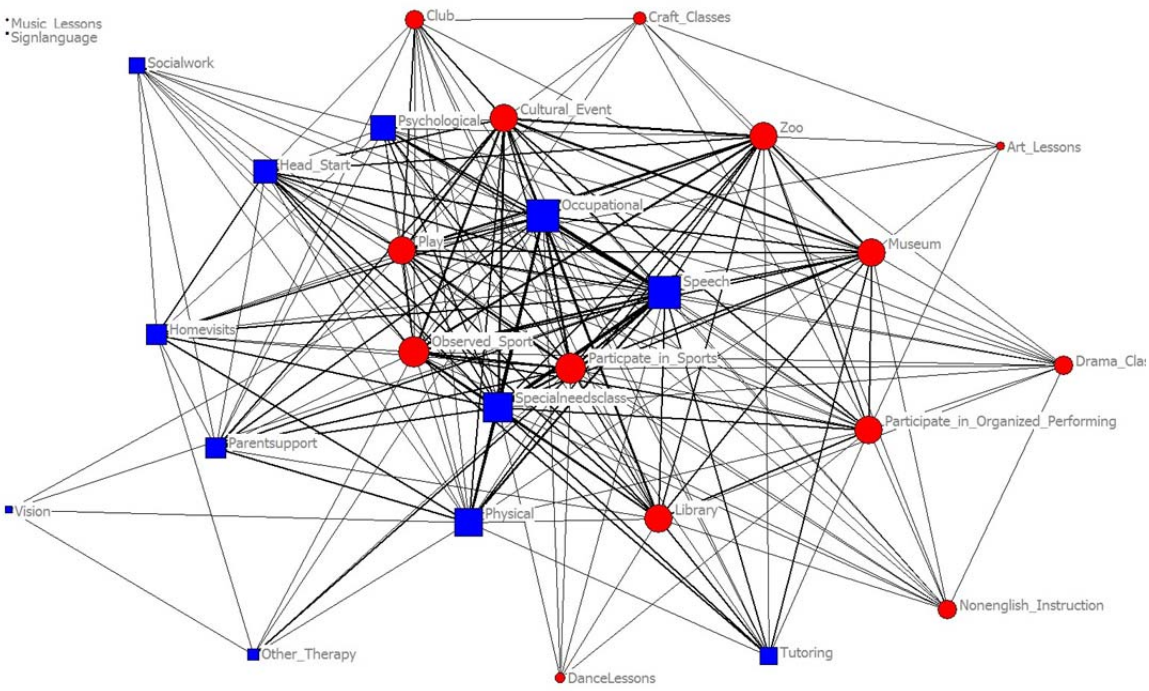

Figure 4.9

Whole network by degree centrality

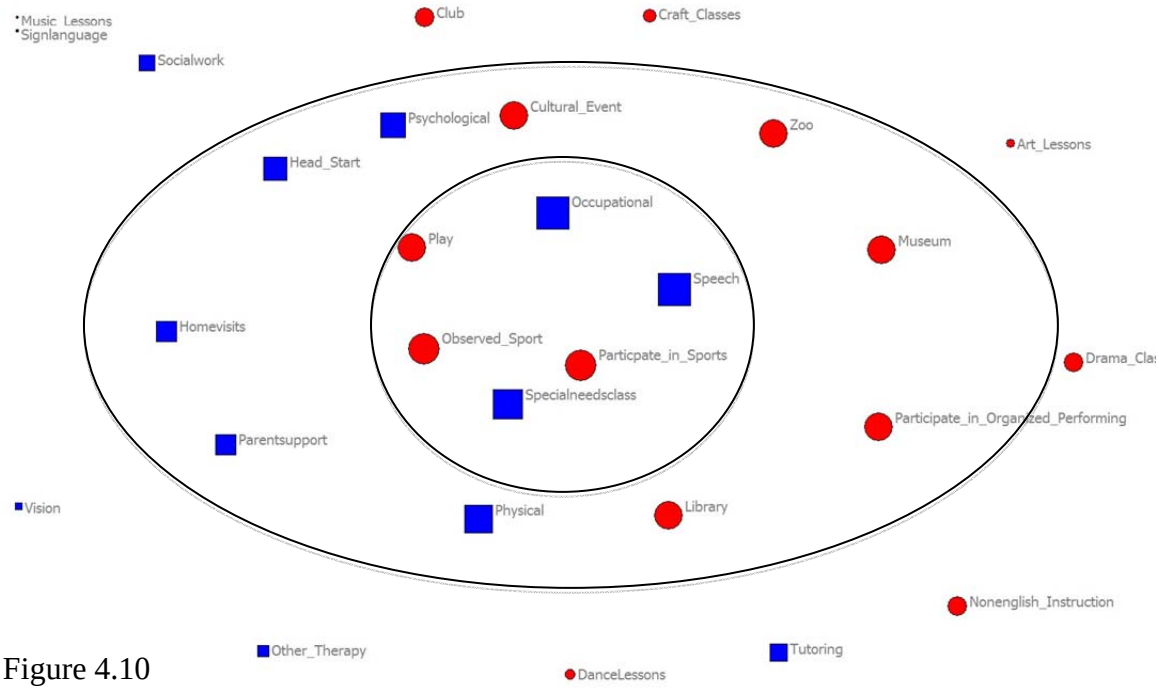

Figure 4.10

Whole network by degree centrality without ties

The previous network mappings aimed to give a visual representation of the networks created from the relationships between the supports used by children with access to special education programs. Similar to eco-mapping, these visual mappings serve as an illustration of the size and differences in networks created of formal and informal supports in this population. Networks varied by the student's included in the study through both their primary disability identified on their school record abstract and the location of their school as noted on the school administrator survey. In addition to the visual mappings presented, quantitative analyses to measure the centrality and density of the networks were also calculated.

4.3 Quantitative Findings

In addition to network mappings, quantitative findings, such as centrality and density, can aid researchers and policy makers in the understanding and measurement of social networks. For this section of the study, the density for the whole network is presented, as well as four measures of centrality for the whole network and subsets of networks.

4.3.1 Density.

The density of a network is a measure of the proportion of realized ties to the number of possible ties. For an affiliation network, such as the one in this specific study, density can be somewhat difficult to interpret. For example, the density of the network is a function of the size of the events, or in this case the availability of the supports. A student, who only uses one support, will create no overlapping ties between supports. Similarly, a student who uses 3 different types of supports creates two overlapping ties. The density of the original 2-mode whole network is 0.1638, meaning that approximately

16% of the possible ties in the dataset are realized. In other words, about 16% of students in the dataset use at least one similar support. The density of the 1-mode support x support network is 1.0. Every support in the data set shares at least one common user with every other support. Although useful in many social network analyses, these measure of density for this particular study are not insightful as to an evaluation of the network. A solution to delivering in interpretable density measure is created using the categorical core-periphery model as described in further analyses.

4.3.2 Centrality.

The most fundamental concept to social network is centrality. Centrality is a measure of the connectivity of nodes using a variety of different measures. The measures of centrality utilized in this study are degree, betweenness, closeness and eigenvector centrality. Measures of centrality were computed for the whole network in figure 4.2 as well as the networks for the learning disability networks created by level of ruralicity.

All four types of centrality measured in this study are given in Table 4.6. They are arranged in descending order, by the degree centrality measure.

Table 4.6

Centrality Measures for Whole Network

	Degree	Closeness	Betweenness	Eigenvector
Cultural Event	0.48	0.574	0.196	0.394
Library	0.441	0.552	0.149	0.369
Speech Therapy*	0.413	0.537	0.128	0.374
Observed Sport	0.352	0.507	0.094	0.306
Zoo	0.338	0.501	0.085	0.288
Participate in Sport	0.323	0.495	0.085	0.267
Play	0.293	0.482	0.074	0.247
Special Needs Classes*	0.245	0.463	0.032	0.247
Head Start*	0.236	0.458	0.1	0.142
Occupational Therapy*	0.197	0.445	0.02	0.201
Museum	0.194	0.444	0.032	0.169
Physical Therapy*	0.148	0.429	0.011	0.151
Parent Support*	0.124	0.42	0.006	0.134
Home Visits*	0.124	0.421	0.008	0.124
Psychological Services*	0.105	0.415	0.007	0.107
Club	0.103	0.414	0.014	0.074
Social Work*	0.096	0.411	0.006	0.098
Participate Perf. Arts	0.096	0.412	0.01	0.081
Private Tutoring*	0.09	0.41	0.004	0.094
Vision Services*	0.057	0.399	0.002	0.059
Craft Classes	0.052	0.399	0.001	0.048
Other Therapy*	0.05	0.387	0.002	0.037
Dance Lessons	0.046	0.396	0.001	0.037
Art Lessons	0.039	0.395	0.001	0.039
Non-English Instruction	0.037	0.394	0.001	0.029
Music Lessons	0.035	0.394	0.001	0.031
Sign language*	0.024	0.39	0	0.027
Drama Classes	0.011	0.374	0	0.012

Another benefit of quantitative social network analysis is the ability to examine how measures of centrality differ through different populations. Consider the maps presented in figures 4.5, 4.6 and 4.7. Centrality measures can also be computed for the matrices that created these figures and compared. Table 4.7 displays the degree centrality measures for the three figures. The supports are presented in same order as table 4.6, by degree centrality measures of the whole network for comparison and consistency.

Table 4.7

Degree Centrality Measures for Learning Disability by School Location

	Learning Disability	**Urban**	**Suburban**	**Rural**
Cultural Event	0.404	0.313	0.524	0.333
Library	0.288	0.250	0.286	0.333
Speech*	0096	0.625	0.143	0.333
Observed Sport	0.385	0.250	0.667	0.133
Zoo	0.288	0.250	0.429	0.133
Participate in Sport	0.115	0.188	0.143	0.257
Play	0.231	0.063	0.381	0.200
Special Needs Classes*	0.423	0.438	0.333	0.200
Head Start*	0.308	0.188	0.286	0.467
Occupational Therapy*	0.308	0.438	0.190	0.333
Museum	0.192	0.188	0.333	0.00
Physical Therapy*	0.192	0.313	0.095	0.200
Parent Support*	0.115	0.063	0.143	0.133
Home Visits*	0.096	0.188	0.048	0.067
Psychological Services*	0.000	0.000	0.000	0.067
Club	0.115	0.000	0.095	0.267
Social Work*	0.346	0.000	0.381	0.000
Participate Perf. Arts	0.269	0.125	0.333	0.067
Private Tutoring*	0.058	0.125	0.095	0.000
Vision Services*	0.019	0.000	0.000	0.067
Craft Classes	0.038	0.063	0.048	0.000
Other Therapy*	0.058	0.125	0.000	0.067
Dance Lessons	0.019	0.063	0.000	0.000
Art Lessons	0.019	0.063	0.000	0.000
Non-English Instruction	0.019	0.000	0.048	0.000
Music Lessons	0.000	0.000	0.000	0.000
Sign language*	0.000	0.000	0.095	0.000
Drama Classes	0.019	0.000	0.048	0.000

Table 4.7 demonstrates the differences in centrality scores for student's whose main disability category is learning disability and as they differ across school locations. Formal supports are denoted by an (*). The data presented across the tables are not standardized, meaning that the distances between the values may not be consistent, and should not be interpreted as such. However, the orders of the measures of centrality do remain consistent. The following tables list the top five supports with regards to degree centrality for three different school locations and for the learning disability network as a whole.

Table 4.8

Degree Centrality measures for Learning Disability

	Whole Network	Urban	Suburban	Rural
Top support	Special Needs Classes*	Speech Therapy*	Observed Sport	Head Start*
2	Cultural Events	Occupational Therapy*	Cultural Event	Cultural Event
3	Observed Sport	Special Needs Class*	Zoo	Library
4	Social Work*	Cultural Event	Play	Occupational Therapy*
5	Head Start*	Physical Therapy*	Social Work*	Speech Therapy*

For table 4.8, the differences in degree centrality scores are more apparent than in table 4.7. Here, only participation in a cultural event is in the top five degree centrality scores for supports over all three locations. For students whose school location is defined as large city or mid sized city and whose main disability category is listed as learning

disability, 4 out of 5 top supports are formal supports. For schools defined as large suburban and midsized suburban, students in this selected subsample, 4 out of 5 top supports are informal supports. The only formal support ranked is using social work services, a support that does not appear in either the urban or rural top supports by degree centrality. The top support for students whose schools are located in small towns and rural communities is participation in Head Start, a federally mandated program.

4.4 Summary

This chapter presented the results of the social network analysis of supports used by families and students with access to special education programs using a large scale data source. First frequencies were presented for main disability category, formal supports, informal supports and school location. Then, an in depth view of the networks created from this data set were presented along with interpretations and different network models. Finally, quantitative social network analysis findings were presented that highlighted differences in centrality scores for populations represented in the data set. The final chapter will summarize the results in relationship to the guiding research questions and propose ideas for further research relating to social network analysis and this and other large scale data sets.

Chapter 5

Summary, Conclusions and Recommendations for Future Research

The purpose of this study was to demonstrate a practical application of social network analysis in the field of education. Although social network analyses are demonstrated throughout the literature of business, sociology, medicine and anthropology, very few studies seek to use social network analysis as a tool of measurement in education. This study utilized the Early Childhood Longitudinal Study (ECLS-K) to explore the possibilities of using social network analysis for educational research.

This study discussed research and literature in social network analysis, by means of social network theory, social network applications in education, and network techniques for visualizing and analyzing 2-mode data. The Individuals with Disabilities Act (IDEA) was introduced as well as an introduction to the importance of support services and visual mapping of these supports for students with access to special education programming. To describe the sample selected for this study, frequency maps were presented of the student's main disability category, formal and informal supports used and the locations of the schools represented in the sample. Social network mappings were presented to help visualize the size and structure of the network presented, along with subsequent network mappings examining individual subsets of the network.

In addition to visual mappings, quantitative social network analysis findings were included as a measure and comparison of the centrality measures of the network. This chapter will summarize the study and present findings related to the guiding research questions. This chapter will also give suggestions for the implications of using social

network analysis for educational research using large scale datasets and will conclude with recommendations for further research for this study and future studies.

5.1 Research Questions and Selected Findings

The research questions that guided this study had two main objectives: 1) to create several network mappings to serve as a visual display of network activity for the use of supports and 2) to produce quantitative findings that identify and measure key characteristics of the support networks evaluated in the ECLS-K. To respond to these primary objectives, four research questions were addressed. This section serves as a final summary and a presentation of key findings as related to the four guiding research questions.

1) *What are the frequencies, types and categories of supports used by families of children who have access to special education programs?*

Frequency tables were produced (see tables 4.1, 4.2 and 4.3) to display the main disability categories for students in the selected sample, as well as the formal and informal supports they used. By far, the largest main disability categories were speech or language impairments (53.5%) followed by learning disabilities (11.4%). Only 10.5% of students in the sample did not have a specific disability listed as their main disability category. No students from the selected sample listed blindness as their primary disability category. Therefore, a total of 10 disabilities are represented in the sample selected for this study.

Frequencies for supports were broken into two categories: formal supports and informal supports. For the purposes of this study, formal supports consisted of people or agencies that are formally organized for the purpose of responding to a particular

family's needs. Formal supports were identified using the fall and spring parent questionnaire under the services received category. There were 12 formal supports identified in the dataset. Only one support, Braille Instruction, was not used by any student in the selected sample. Speech therapy (31.3%) and Special Needs Classes (24.5%) were supports used the most frequently by students in the sample.

Informal supports were also identified in the ECLS-K. These supports are defined as supports that are not formally placed in a child's life as a result of their disability status. Informal supports were identified in the dataset from the Home Environments Questionnaire and asked about the child's use of the library, dance classes and other resources available to the student. There were 15 informal supports identified in the survey. The most frequently used informal supports were participation in a cultural events (49%) and usage of the library (44.1%). The next question pertains to the social network mappings created based on the networks of support systems.

2) What might social network mappings, of these supports and their common members look like and how might they relate to Bronfenbrenner's Ecological Model for human development?

To address the second guiding research question, data were cleaned in SPSS and Excel and imported into Ucinet. NetDraw was then used to create network mappings of the whole network, formal support network, informal support network, and a mapping created based on Bronfenbrenner's Ecological model. Figures 4.2, 4.3, 4.4, and 4.5 are visual representations of the supports used by the student's selected for this study. The whole network map, although crowded, demonstrated that a network does indeed exist between the supports used by students with access to special education programs. To

examine the network further, and offer a clearer picture of the network, three additional mappings were created. Figures 4.3 and 4.4 are network mappings of the formal and informal supports separately. The varying network structures of these mappings indicate that differences may exist between the utilization of formal and informal supports for this sample. A social network mapping was also created for a single disability category, as identified on student's school record abstract. The network created for students identified with a learning disability gives an in depth view of this specific network and how it may differ from other disability networks. Appendix G displays the network mappings for the other 9 disabilities represented in this study.

To aid in the demonstration of the practicality of social network analysis and social network mappings in education research, the theoretical framework presented by Bronfennbrenner's (1979) Ecological Model for Human Development was used as the basic outline for this study. Similar to Bronfennbrenner's model, the relevancy of supports was demonstrated by their location on the network maps. One specific network mapping created for this study included mapping the whole network and arranging the supports on the network mapping by degree centrality, a common network measure. The result is a mapping, as seen in figure 4.9 that has both similarities and distinctions from Bronfennbrenner's original model. Similar to Bronfennbrenner's model, the quality of the relationships between the supports differs between supports. The inherent structure of the network, when identified by degree centrality is very similar to the concentric circles in the ecological model.

Unfortunately, this dataset did not lend itself to variables that measured the supports of at the peer level and only support on the parent level. Therefore, this map

consists primarily of supports used on the periphery of Bronfennbrenner's (1979) model. This study identified different supports available to children with access to special education programing, under the theoretical framework presented by Bronfennbrenner, that the quality and context of these relationships matter. In addition to network mappings, quantitative findings relating to the centrality and density of the previous network mappings are included.

3) How do the different measures of centrality, strength of ties and density vary through different populations in the data set?

Quantitative social network findings were also presented in the results section. Network density was calculated for the whole network, and four types of centrality were calculated for the whole network and individual main disability support networks. Varying strength of ties can be evaluated by further examining the network mappings. The density of the 2-mode network created by the whole dataset was 0.16; meaning about 16% of the possible connections between supports was realized. This traditional measure of density is not insightful for researchers trying to evaluate this type of 2-mode network data. Further analyses to evaluate network density will be discussed in the section on further research.

Degree, closeness, betweenness and eigenvector centrality scores were computed and presented in table 4.6. The table was sorted by degree centrality measures, to enable comparisons among the different measures of centrality. The support that received the highest centrality measure, for all centrality types was participation in a cultural event, followed by visiting a library and Speech therapy. As demonstrated in table 4.6 the measures of centrality remain fairly consistent across all measures of centrality. With the

exception of speech therapy, the supports with the top centrality measures are all informal supports. Speech or language impairment accounts for 53% of the main disability of students in the sample. These top informal supports are then followed by a large block of formal supports, with the exception of going to a museum. These measures of centrality can also be broken into measures for students with specific primary disability and location of their school.

To compare the centrality measures for varying groups, centrality measures were computed for only students whose main learning disability category was listed as learning disability, then separated by the location of the school the student attended. Tables 4.7 and 4.8 present the findings of the degree centrality measures for these groups. Overall, there was much disparity between the supports with the highest centrality measures for those in an urban, suburban and rural school environment. Variances occurred between both the order of the supports with the highest degree centrality, as well as the formal or informal nature of the supports listed in the top five measured.

The differences in the functionality of the strengths of ties measure can be perceived through the network mappings for formal and informal supports in figures 4.3 and 4.4. Here the thicker the line or tie, the more members the two supports have in common. Figure 4.3 consists of very few strong, or thick ties, whereas there appears to be a core, centralized group of supports located toward the center of the informal supports maps. Although these results are exploratory and fairly speculative, using Multi-Dimensional Scaling techniques to view formal and informal supports does indicate and highlight that differences do exist in the fundamental nature of the networks created for formal and informal supports for students with access to special education. Combining

these quantitative findings with the network mappings can be used to gain an accurate, unique view of the supports used by families of children with access to special education programs.

4) *What might the quantitative findings, using traditional social networking techniques described above, tell us about the population and policy implications?*

Although the primary purpose of this study was to demonstrate the use of social network analysis in educational research, the practicality of social network analysis for this specific data set and sample selected are intrinsic to the study itself. This study first identified that a network existed between supports used by families and children with access to special education programs. Then, this study identified differences between specific populations, such as differences that occurred between levels of ruralicity and the primary disability identified for the students in the sample. This study has direct policy implications for the Individuals with Disabilities Act (IDEA) and asks the question: Do students in different locations with different disabilities use different supports and is there any relationship between the ability of supports and the usage of supports for certain populations? Another question may be how might federally mandated supports, such as head start use these measures of the social networks to ensure that the populations they aim to serve are being fairly represented.

A key finding in this study is that both formal and informal supports are being used, and they are being used along with other formal and informal supports. One of the main goals of IDEA is to enhance the capabilities of families to meet the unique needs of their infants and toddlers who have access to special education programs (IDEA 2000, 2004. The availability and use of supports, both formal and informal, can have a great impact

on a family's ability to meet their individual child's needs. Families and children are using supports and the quality and context of these supports should be evaluated. Social network analysis is one way educational researchers and policy makers can evaluate the use of these supports. By offering a network mapping, in which a specific population is displayed along with the supports used by that population, policy makers, teachers, and practitioners can gain insight into the quality and context of supports.

5.2 Additional findings

In addition to the guiding research questions, the location of the school was also used as a way to distinguish different network mappings and quantitative results. Due to the design of the ECLS-K and the questionnaires used in this study, the variable addressing the location of the school in which the child attended was an easily obtained variable that lent itself as a filtering variable. The literature also identifies level of ruralicity has an effect on the accessibility to supports (Mallory 2010, Rude et al., 2005, Jung & Bradley 2006). Therefore, to give a clearer, more in depth view of the networks, the location of the school was used to create different network mappings and produce measures of centrality. The final outcome was that the networks created and the subsequent centrality measures differed across levels of ruralicity across the sample selected for this study. This finding invites further research regarding the structural differences in networks for this specific population.

5.3 Implications for Further Research

This study served as an exploration into the capabilities of using social network analysis to evaluate a large scale dataset in educational research. The results suggest that social network analysis is a methodological tool, backed by social network theory and

can be coupled with educational research to offer a unique and practical view of the supports used by families of children with access to special education programs. This study offers implications for further research that build upon the current exploratory study and research that is broadened through other datasets. Further implications suggest additional research using social network analysis on the ECLS-K as well as proposed future research ideas is needed outside this dataset.

The results and findings depicted in this study could be elaborated on by the inclusion of weights included with the data set. One challenge in working with a dataset of this size is the use of weights to indicate the relative strength of the observation. The ECLS-K is not a simple random sample; therefore, not all students, teachers and schools had an equal opportunity of being selected to participate in the ECLS-K. Using weights allows the researcher to make statements about the population of U.S. children who were in kindergarten in 1998-99, not just the sample included in the ECLS-K (2010). First the proper weight must be selected and then utilized in the analysis to satisfy representation of the population of kindergartners in 1998-1999. Because the current study will use the base year (or K year) and will use data from child, parent and teacher surveys, the appropriate weight in future studies using these same variables is BYCOMW0. This weight is used for round 1 and 2 assessment data as well as parent and teacher data.

Methodologically speaking, an additional limitation that could be examined through further studies is the measure associated with density for 2-mode networks. Traditional density techniques give little insight into the structure of a 2-mode network such as the one created for the current study. An alternative to this traditional approach to density is to use a two-mode correspondence analysis coupled with weighting the data

appropriately. This alternative operates on multivariate binary cross-tabulations and illustrates groupings of high and low density for 2-mode networks. Additional 2-mode core-periphery analysis could be completed creating a student by support matrix in which supports with high and low density could be distinguished, and density measures run again on the new categories and compared.

In addition to further methodological research, a more practical application of social network analysis and the study of supports used by families of children with access to special education programming should be addressed. The ECLS-K base year dataset was chosen for this study because of the ongoing support it has received as a national, longitudinal dataset. However, other datasets may offer more variables and supports that lend themselves easily to social network analysis. For example the Pre-Elementary Education Longitudinal Study (PEELS) is a nationally sponsored dataset that collects information on cohorts of nationally representative children with disabilities.

5.4 Final Conclusions

Urie Bronfenbrenner (1979) wrote, “in the interests of advancing fundamental research on human development, basic science needs public policy even more than public policy needs basic science" (p. 8). Although this study serves as a methodological application, demonstrating social network analysis and implications for network studies in educational research, the fundamental importance in the context of this research cannot be simply ignored. The network mappings and quantitative findings show the relevancy of studying educational research through a social network lens. Enabling techniques of graph theory and matrix algebra coupled with sociological and anthropological theories, social network analysis offers an innovative and unique perspective to traditional education research.

Appendix A

From ECLS-K Base Year Instrumentation

Fall Parent Interview

Child's Health and Well-Being –CHQ

CHILD'S HEALTH AND WELL-BEING - CHQ

CHQ.005 Now I have some questions about {CHILD}'s health. How much did {CHILD} weigh when {he/she} was born?

CAPI INSTRUCTION: RANGE CHECK: 1-13 FOR POUNDS, 0-16 FOR OUNCES.

|__|__| AND |__|__|
ENTER POUNDS ENTER OUNCES

REFUSED 77
DON'T KNOW 99

BOX 0

CHECK ITEM CHQ.007:
- IF REFUSED OR DON'T KNOW FOR THE NUMBER OF POUNDS (CHQ.005 = 77 OR 99 FOR NUMBER OF POUNDS)
  OR
  IF THE NUMBER OF POUNDS IS 5 AND REFUSED OR DON'T KNOW FOR THE NUMBER OF OUNCES (CHQ.005 = 5 FOR POUNDS AND 77 OR 99 FOR OUNCES),
  CONTINUE WITH CHQ.010.
- OTHERWISE, GO TO BOX 1.

CHQ.010 When {he/she} was born, did {CHILD} weigh more than 5 1/2 pounds?

YES ..... 1 (BOX 1)
NO 2
REFUSED 7
DON'T KNOW..... 9

CHQ.015 Did {he/she} weigh more than 3 pounds?

YES 1
NO 2
REFUSED 7
DON'T KNOW..... 9

BOX 1

CHECK ITEM CHQ.020:
- IF MORE THAN 1 SAMPLED CHILD TO BE ASKED ABOUT AND CURRENTLY ASKING ABOUT CHILD 2, GO TO CHQ.095.
- OTHERWISE, CONTINUE WITH CHQ.025.

CHQ.025 Was {CHILD} born more than two weeks before {he/she} was due?

YES	1	
NO	2	(CHQ.035)
REFUSED	7	(CHQ.035)
DON'T KNOW	9	(CHQ.035)

CHQ.030 How many days or weeks early was {he/she}?

CAPI INSTRUCTION: RANGE CHECK: 1-31 IF DAYS IS THE UNIT; 1-16 IF WEEKS IS THE UNIT.

|___|___|
ENTER NUMBER

REFUSED	77
DON'T KNOW	99

ENTER UNIT

WEEKS	1
DAYS	2
REFUSED	7
DON'T KNOW	9

CHQ.035 Was {CHILD} a twin, triplet, or other child born as part of a multiple birth?

IF HIGHER-ORDER MULTIPLE BIRTH, CODE NUMBER OF CHILDREN BORN TOGETHER, EVEN IF ONE OR MORE WAS STILLBORN OR DIED SHORTLY AFTER BIRTH.

NO	1	(CHQ.095)
YES, A TWIN	2	
YES, A TRIPLET	3	
YES, MULTIPLE BIRTH (4 OR MORE)	4	
REFUSED	7	(CHQ.095)
DON'T KNOW	9	(CHQ.095)

CHQ.040 CODE WITHOUT ASKING IF ALREADY KNOWN. OTHERWISE ASK:

{Is {CHILD}'s twin living?/Are all the other children born in the multiple birth still living?}

CAPI INSTRUCTIONS: DISPLAY "IS {CHILD}'S TWIN LIVING?" IF CHQ.035 = 2. OTHERWISE, DISPLAY "ARE ALL THE OTHER CHILDREN BORN IN THE MULTIPLE BIRTH STILL LIVING?"

YES, TWIN IS LIVING (OR ALL OTHER CHILDREN ARE LIVING)	1	
NO, TWIN DIED (OR ALL OTHER CHILDREN DIED)	2	(CHQ.070)
[FOR HIGHER-ORDER MULTIPLE BIRTHS ONLY] ONE OR MORE DIED, OTHERS ARE LIVING	3	
REFUSED	7	
DON'T KNOW	9	

CHQ.045 {Does {CHILD}'s twin/Do they} live in this household?

CAPI INSTRUCTIONS: DISPLAY "DOES {CHILD}'S TWIN" IF CHQ.035 = 2. OTHERWISE, DISPLAY "DO THEY".

LIVES HERE	1
LIVES ELSEWHERE	2
SOME LIVE HERE/SOME LIVE ELSEWHERE	3
REFUSED	7
DON'T KNOW	9

CHQ.050 {What is {CHILD}'s twin's name?/What are the names of the other children born with {CHILD} {who are living}?}

CAPI INSTRUCTIONS: DISPLAY "WHAT IS {CHILD}'S TWIN'S NAME?" IF CHQ.035 = 2. OTHERWISE, DISPLAY "WHAT ARE THE NAMES OF THE OTHER CHILDREN BORN WITH {CHILD} {WHO ARE LIVING}?"

CAPI INSTRUCTIONS: DISPLAY "WHO ARE LIVING" IF CHQ.040 = 3, 7, OR 9. OTHERWISE, USE A NULL DISPLAY.

ENTER CHILD NAME 1 _____
ENTER CHILD NAME 2 _____
ENTER CHILD NAME 3 _____

BOX 2

CHECK ITEM CHQ.055:
- IF THE OTHER TWIN (OTHER CHILDREN) LIVES IN THIS HOUSEHOLD (CHQ.045=1), GO TO CHQ.070.
- OTHERWISE, CONTINUE WITH CHQ.060.

CHQ.060 CODE IF OBVIOUS, OTHERWISE ASK:

Is {EACH CHILD NAMED IN CHQ.050} a boy or a girl?

RESPONSES: 1 = BOY, 2 = GIRL, 7 = REFUSED, 9 = DON'T KNOW.

	GENDER
{CHILD 1}	|__|
{CHILD 2}	|__|
{CHILD 3}	|__|
{CHILD 4}	|__|

CHQ.070 {{Are/Were} {CHILD} and {{TWIN's NAME}/{CHILD}'s twin}} identical twins or fraternal (non-identical) twins?/{Is/Was} {CHILD} identical to any of the other children born with {CHILD}?}

CAPI INSTRUCTIONS: DISPLAY "{ARE/WERE} {CHILD} AND {{TWIN'S NAME}/{CHILD}'S TWIN} IDENTICAL TWINS OR FRATERNAL (NON-IDENTICAL) TWINS?" IF CHQ.035 = 2. OTHERWISE, DISPLAY "{IS/WAS} {CHILD} IDENTICAL TO ANY OF THE OTHER CHILDREN BORN WITH {CHILD}?"

CAPI INSTRUCTIONS: DISPLAY "ARE" AND "IS" IF CHQ.040 = 1, 3, 7, OR 9. OTHERWISE, DISPLAY "WERE" AND "WAS".

CAPI INSTRUCTIONS: DISPLAY "{TWIN'S NAME}" (THE NAME COLLECTED AT CHQ.050) IF CHQ.040 = 1, 7 OR 9. OTHERWISE, DISPLAY "{CHILD}'S TWIN".

IDENTICAL	1	
FRATERNAL	2	
MULTIPLE BIRTH CONTAINING AN IDENTICAL TWIN PAIR OF WHICH {CHILD} IS ONE	3	
MULTIPLE BIRTH WITH NO IDENTICAL TWIN PAIR, OR {CHILD} IS NOT ONE OF THE IDENTICAL TWINS	4	
REFUSED	7	
DON'T KNOW	9	

CHQ.075 Which one was born first?

FOCAL CHILD	1	
TWIN (OR OTHER CHILD IN MULTIPLE BIRTH)	2	
REFUSED	7	
DON'T KNOW	9	

CHQ.080 Which one weighed {more/the most} at birth?

CAPI INSTRUCTION: DISPLAY "MORE" IF CHQ.035 = 2. OTHERWISE, DISPLAY "THE MOST".

FOCAL CHILD	1	
TWIN (OR OTHER CHILD IN MULTIPLE BIRTH)	2	
BOTH WEIGHED ABOUT THE SAME	3	
REFUSED	7	
DON'T KNOW	9	

CHQ.085 Apart from being a {twin/part of a multiple birth}, were there any complications in {CHILD}'s birth or delivery?

CAPI INSTRUCTIONS: DISPLAY "TWIN", IF CHQ.035 = 2. OTHERWISE, DISPLAY "PART OF A MULTIPLE BIRTH".

YES	1	
NO	2	(CHQ.095)
REFUSED	7	(CHQ.095)
DON'T KNOW	9	(CHQ.095)

HELP AVAILABLE

CHQ.090 What were the complications?

CODE ALL THAT APPLY

PREMATURE	1
ANOXIA/BABY DIDN'T GET ENOUGH OXYGEN	2
ECLAMPSIA/PRE-ECLAMPSIA/MOTHER'S HIGH BLOOD PRESSURE/TOXEMIA/ SWELLING	3
CESAREAN SECTION	4
RESPIRATORY DISTRESS SYNDROME	5
MECONIUM/BABY'S FECAL MATTER EXCRETED AT OR NEAR BIRTH	6
FETAL DISTRESS	7
BREECH/MALPRESENTATION/BABY'S FEET CAME OUT FIRST	8
PREMATURE RUPTURE OF MEMBRANE	9
DYSFUNCTIONAL LABOR	10
OTHER (SPECIFY) _____ _____	11
REFUSED	77
DON'T KNOW	99

CHQ.095 For the next set of questions, please base your answer on how {CHILD} compares to other children of the same age.

{CHILD} is independent and takes care of {himself/herself} ...

Better than other children {his/her} age,	1
As well as other children,	2
Slightly less well than other children, or	3
Much less well than other children?	4
REFUSED	7
DON'T KNOW	9

CHQ.100 Does {CHILD} pay attention ....

Better than other children {his/her} age,	1
As well as other children,	2
Slightly less well than other children, or	3
Much less well than other children?	4
REFUSED	7
DON'T KNOW	9

CHQ.105 Does {CHILD} learn, think, and solve problems ...

Better than other children {his/her} age, ...	1	
As well as other children,.....	2	
Slightly less well than other children, or	3	
Much less well than other children?	4	
REFUSED	7	
DON'T KNOW	9	

BOX 3

CHECK ITEM CHQ.110:

- IF CHILD HAS PROBLEMS WITH PAYING ATTENTION (CHQ.100=3 OR 4)
  OR
  CHILD HAS PROBLEMS WITH LEARNING, THINKING AND SOLVING PROBLEMS (CHQ.105=3 OR 4),
  CONTINUE WITH CHQ.115.
- OTHERWISE, GO TO CHQ.140.

HELP AVAILABLE

CHQ.115 Has {CHILD} been evaluated by a professional in response to {his/her} ability to pay attention or learn?

YES	1	
NO	2	(CHQ.140)
REFUSED	7	(CHQ.140)
DON'T KNOW.....	9	(CHQ.140)

CHQ.120 Did you obtain a diagnosis of a problem from a professional?

YES	1	
NO	2	(CHQ.140)
REFUSED	7	(CHQ.140)
DON'T KNOW.....	9	(CHQ.140)

HELP AVAILABLE

CHQ.125 What was the diagnosis?

PROBE: What was the primary diagnosis?

LEARNING DISABILITY.....	1
ATTENTION DEFICIT DISORDER (ADD).....	2
DEVELOPMENTAL DELAY	3
DYSLEXIA.....	4
MENTAL RETARDATION	5
OTHER (SPECIFY) _____	6
_____	
REFUSED	7
DON'T KNOW.....	9

CHQ.130 How old was {CHILD} when the first diagnosis of a problem was made?

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.140.

|___|___|
ENTER AGE

REFUSED	77	(CHQ.140)
DON'T KNOW	99	

ENTER UNIT

MONTHS	1	(CHQ.140)
YEARS	2	(CHQ.140)
REFUSED	7	(CHQ.140)
DON'T KNOW	9	

CHQ.135 What was the month and year when the diagnosis was made?

IF R DOESN'T KNOW MONTH, ASK: Do you remember the year?

IF THERE WAS MORE THAN ONE DIAGNOSIS, ASK FOR THE EARLIEST.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___|	AND	|___|___|___|___|
ENTER MONTH		ENTER YEAR

REFUSED	777
DON'T KNOW	999

CHQ.140 Thinking about {CHILD}'s overall activity level, would you say {he/she} is

Less active than other children of {his/her} age,	1	(CHQ.175)
About as active,	2	(CHQ.175)
Slightly more active, or	3	(CHQ.175)
A lot more active than other children of {his/her} age?	4	
REFUSED	7	(CHQ.175)
DON'T KNOW	9	(CHQ.175)

CHQ.145 Do you have any concerns about {CHILD}'s overall activity level?

YES	1	
NO	2	(CHQ.175)
REFUSED	7	(CHQ.175)
DON'T KNOW	9	(CHQ.175)

HELP AVAILABLE

CHQ.150 Has {CHILD} been evaluated by a professional in response to {his/her} overall activity level?

YES	1	
NO	2	(CHQ.175)
REFUSED	7	(CHQ.175)
DON'T KNOW	9	(CHQ.175)

CHQ.155 Did you obtain a diagnosis of a problem from a professional?

YES	1	
NO	2	(CHQ.175)
REFUSED	7	(CHQ.175)
DON'T KNOW	9	(CHQ.175)

HELP AVAILABLE

CHQ.160 What was the diagnosis?

PROBE: What was the primary diagnosis?

LEARNING DISABILITY	1
ATTENTION DEFICIT DISORDER (ADD)	2
HYPERACTIVITY	3
DYSLEXIA	4
MENTAL RETARDATION	5
OTHER (SPECIFY) _____	6
_____	
REFUSED	7
DON'T KNOW	9

CHQ.165 How old was {CHILD} when the first diagnosis of a problem was made?

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.175.

|__|__|
ENTER AGE

REFUSED	77	(CHQ.175)
DON'T KNOW	99	

ENTER UNIT

MONTHS	1	(CHQ.175)
YEARS	2	(CHQ.175)
REFUSED	7	(CHQ.175)
DON'T KNOW	9	

CHQ.170 What was the month and year when the diagnosis was made?

IF R DOESN'T KNOW MONTH, ASK: Do you remember the year?

IF THERE WAS MORE THAN ONE DIAGNOSIS, ASK FOR THE EARLIEST.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___| AND |___|___|___|___|
ENTER MONTH ENTER YEAR

REFUSED 777
DON'T KNOW.....999

CHQ.175 Does {CHILD} show good coordination in moving {his/her} arms and legs? Would you say {he/she} does this ...

IF RESPONDENT REPORTS DIFFERENTIALLY FOR ARMS OR LEGS OR FOR SIDES OF THE BODY, SAY: Answer for the part of the body your child has the most difficulty using.

IF CHILD HAS EPISODIC TROUBLE, SAY: Answer for what you consider a typical day.

Better than other children {his/her} age, ...	1	(CHQ.200)
As well as other children, ...	2	(CHQ.200)
Slightly less well than other children, or.....	3	
Much less well than other children?	4	
REFUSED	7	(CHQ.200)
DON'T KNOW.....	9	(CHQ.200)

HELP AVAILABLE

CHQ.180 Has {CHILD} been evaluated by a professional in response to the use of {his/her} limbs?

YES.....	1	
NO	2	(CHQ.200)
REFUSED	7	(CHQ.200)
DON'T KNOW.....	9	(CHQ.200)

CHQ.185 Did you obtain a diagnosis of a problem from a professional?

YES.....	1	
NO	2	(CHQ.200)
REFUSED	7	(CHQ.200)
DON'T KNOW.....	9	(CHQ.200)

CHQ.190 How old was {CHILD} when the first diagnosis of a problem was made?

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.200.

|___|___|
ENTER AGE

REFUSED 77 (CHQ.200)
DON'T KNOW 99

ENTER UNIT

MONTHS 1 (CHQ.200)
YEARS 2 (CHQ.200)
REFUSED 7 (CHQ.200)
DON'T KNOW 9

CHQ.195 What was the month and year when the diagnosis was made?

IF R DOESN'T KNOW MONTH, ASK: Do you remember the year?

IF THERE WAS MORE THAN ONE DIAGNOSIS, ASK FOR THE EARLIEST.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___| AND |___|___|___|___|
ENTER MONTH ENTER YEAR

REFUSED 777
DON'T KNOW.....999

CHQ.200 Does {CHILD} pronounce words, communicate with and understand others ...

IF RESPONDENT INDICATES CHILD DIFFERS ON ANY OF THE AREAS (E.G., CAN UNDERSTAND BUT NOT PRONOUNCE), SAY: Answer for the area in which the child has the most difficulty.

Better than other children {his/her} age, ... 1
As well as other children, ... 2
Slightly less well than other children, or..... 3 (CHQ.210)
Much less well than other children? 4 (CHQ.210)
REFUSED 7
DON'T KNOW..... 9

CHQ.205 When {CHILD} was younger, did {he/she} ever have unusual difficulty pronouncing words, communicating with, or understanding others?

YES	1	
NO	2	(CHQ.230)
REFUSED	7	(CHQ.230)
DON'T KNOW	9	(CHQ.230)

HELP AVAILABLE

CHQ.210 Has {CHILD} been evaluated by a professional in response to {his/her} ability to communicate?

YES	1	
NO	2	(CHQ.230)
REFUSED	7	(CHQ.230)
DON'T KNOW	9	(CHQ.230)

CHQ.215 Did you obtain a diagnosis of a problem from a professional?

YES	1	
NO	2	(CHQ.230)
REFUSED	7	(CHQ.230)
DON'T KNOW	9	(CHQ.230)

CHQ.220 How old was {CHILD} when the first diagnosis of a problem was made?

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.230.

|__|__|
ENTER AGE

REFUSED	77	(CHQ.230)
DON'T KNOW	99	

ENTER UNIT

MONTHS	1	(CHQ.230)
YEARS	2	(CHQ.230)
REFUSED	7	(CHQ.230)
DON'T KNOW	9	

CHQ.225 What was the month and year when the diagnosis was made?

IF R DOESN'T KNOW MONTH, ASK: Do you remember the year?

IF THERE WAS MORE THAN ONE DIAGNOSIS, ASK FOR THE EARLIEST.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|__|__| AND |__|__|__|__|
ENTER MONTH ENTER YEAR

REFUSED 777
DON'T KNOW.....999

CHQ.230 Does {CHILD} have difficulty hearing and understanding speech in a normal conversation?

YES..... 1
NO 2
REFUSED 7
DON'T KNOW..... 9

CHQ.235 Have you had {CHILD}'s hearing evaluated by a professional? **HELP AVAILABLE**

YES..... 1
NO 2
REFUSED 7
DON'T KNOW..... 9

BOX 4

CHECK ITEM CHQ.240:
- IF CHILD HAS NO DIFFICULTY UNDERSTANDING SPEECH (CHQ.230=2, 7, OR 9), GO TO CHQ.285.
- IF CHILD HAS DIFFICULTY UNDERSTANDING SPEECH (CHQ.230=1) AND CHILD HAS NOT HAD HEARING EVALUATED (CHQ.235=2, 7, OR 9), GO TO CHQ.260
- OTHERWISE, CONTINUE WITH CHQ.245.

CHQ.245 Did you obtain a diagnosis of a problem from a professional?

YES 1
NO 2 (CHQ.285)
REFUSED 7 (CHQ.285)
DON'T KNOW..... 9 (CHQ.285)

CHQ.250 How old was {CHILD} when the first diagnosis of a problem was made?

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.260.

|___|___|
ENTER AGE

REFUSED 77 (CHQ.260)
DON'T KNOW 99

ENTER UNIT

MONTHS 1 (CHQ.260)
YEARS 2 (CHQ.260)
REFUSED 7 (CHQ.260)
DON'T KNOW 9

CHQ.255 What was the month and year {CHILD}'s hearing was evaluated?

IF R DOESN'T KNOW MONTH, ASK: Do you remember the year?

IF THERE WAS MORE THAN ONE DIAGNOSIS, ASK FOR THE EARLIEST.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___| AND |___|___|___|___|
ENTER MONTH ENTER YEAR

REFUSED 777
DON'T KNOW.....999

CHQ.260 Which of the following best describes {CHILD}'s hearing loss? Is {he/she}

Deaf in both ears, ... 1
Deaf in one ear and hard of hearing in the other, ... 2
Deaf in one ear and normally hearing in the other, ... 3
Hard of hearing in both ears, or 4
Hard of hearing in one ear and normally hearing in the other? 5
REFUSED 7
DON'T KNOW 9

CHQ.265 Does {CHILD} usually wear a hearing aid?

YES..... 1
NO 2
REFUSED 7
DON'T KNOW..... 9

CHQ.270 Does {CHILD} have cochlear implants? **HELP AVAILABLE**

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

BOX 5

CHECK ITEM CHQ.275:

- IF CHILD DOES NOT WEAR HEARING AID (CHQ.265=2, 7, OR 9) AND DOES NOT HAVE COCHLEAR IMPLANTS (CHQ.270=2, 7, OR 9), GO TO CHQ.285.
- OTHERWISE, CONTINUE WITH CHQ.280.

CHQ.280 What is the effect of the device on {CHILD}'s ability to hear and understand speech in normal conversations? Does it ...

Greatly improve {his/her} hearing,	1
Somewhat improve {his/her} hearing,	2
Minimally improve {his/her} hearing, or	3
Does it not improve {his/her} hearing?	4
REFUSED	7
DON'T KNOW	9

CHQ.285 Now I want to ask you about {CHILD}'s vision. Does {CHILD} have difficulty seeing objects in the distance or letters on paper?

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

CHQ.290 Has {CHILD}'s vision been evaluated by a professional? **HELP AVAILABLE**

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

BOX 6

CHECK ITEM CHQ.295:

- IF CHILD HAS NO DIFFICULTY SEEING (CHQ.285=2, 7, OR 9), GO TO CHQ.325.
- IF CHILD HAS DIFFICULTY SEEING (CHQ.285=1)
  AND
  CHILD HAS NOT HAD VISION EVALUATED (CHQ.290=2, 7, OR 9),
  GO TO CHQ.320.
- OTHERWISE, CONTINUE WITH CHQ.300.

CHQ.300 Did you obtain a diagnosis of a problem from a professional?

YES	1	
NO	2	(CHQ.325)
REFUSED	7	(CHQ.325)
DON'T KNOW	9	(CHQ.325)

CHQ.305 How old was {CHILD} when the first diagnosis of a problem was made?

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.315.

|___|___|
ENTER AGE

REFUSED	77	(CHQ.315)
DON'T KNOW	99	

ENTER UNIT

MONTHS	1	(CHQ.315)
YEARS	2	(CHQ.315)
REFUSED	7	(CHQ.315)
DON'T KNOW	9	

CHQ.310 What was the month and year when {CHILD}'s vision was evaluated?

IF R DOESN'T KNOW MONTH, ASK: Do you remember the year?

IF THERE WAS MORE THAN ONE DIAGNOSIS, ASK FOR THE EARLIEST.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___| AND |___|___|___|___|
ENTER MONTH ENTER YEAR

REFUSED	777
DON'T KNOW	999

CHQ.315 Is {CHILD}'s eyesight ...

Correctable with glasses,	1	(CHQ.325)
Improvable with glasses, or	2	
Not correctable with glasses?	3	
REFUSED	7	
DON'T KNOW	9	

CHQ.320 Please tell me which of the following {CHILD}'s **best** eyesight allows {him/her} to see.

Print in children's story books,	1
Form and/or color of objects, but not detail,	2
Shadows,	3
Lights, or	4
Does {CHILD} see no light or have no light perception?	5
REFUSED	7
DON'T KNOW	9

CHQ.325 Would you say {CHILD} behaves and relates to other children and adults ...

Better than other children {his/her} age,	1
As well as other children,	2
Slightly less well than other children, or	3
Much less well than other children?	4
REFUSED	7
DON'T KNOW	9

CHQ.326 Did {CHILD} ever have frequent or repeated ear infections?

IF NECESSARY SAY: Consider 3 or more ear infections in a 12 month time period as frequent or repeated.

YES	1	
NO	2	(CHQ.330)
REFUSED	7	(CHQ.330)
DON'T KNOW	9	(CHQ.330)

CHQ.327 Did {CHILD} have frequent or repeated ear infections in the last 12 months?

IF NECESSARY SAY: Consider 3 or more ear infections in the last 12 months as frequent or repeated.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

CHQ.330 Would you say {CHILD}'s health is ...

Excellent,	1
Very good,	2
Good,	3
Fair, or	4
Poor?	5
REFUSED	7
DON'T KNOW	9

BOX 7

CHECK ITEM CHQ.355:

- IF CHILD DOES NOT HAVE ANY DISABILITIES AND HIS OR HER HEALTH IS GOOD TO EXCELLENT, THAT IS:
  CHQ.095=1, 2, 7, 9 (INDEPENDENCE)
  AND
  CHQ.100=1, 2, 7, 9 (ATTENTION)
  AND
  CHQ.105=1, 2, 7, 9 (THINK/LEARN/SOLVE)
  AND
  CHQ.140=1, 2, 3, 7, 9 (HYPERACTIVE)
  AND
  CHQ.175=1, 2, 7, 9 (COORDINATION)
  AND
  CHQ.200=1, 2, 7, 9 (COMMUNICATION)
  AND
  CHQ.230=2, 7, 9 (HEARING)
  AND
  CHQ.285=2, 7, 9 (VISION)
  AND
  CHQ.325=1, 2, 7, 9 (BEHAVIOR)
  AND
  CHQ.330=1, 2, 3, 7, 9 (HEALTH),
  GO TO BOX 11.
- OTHERWISE, CONTINUE WITH CHQ.340.

CHQ.340 Prior to this school year, did {CHILD} ever receive therapy services or take part in a program for children with disabilities?

IF ASKED, CHILDREN WITH DISABILITIES INCLUDE CHILDREN WITH DEVELOPMENTAL DELAYS, COMMUNICATION IMPAIRMENTS, OR SPECIAL HEALTH CARE NEEDS.

YES	1	
NO	2	(BOX 10)
REFUSED	7	(BOX 10)
DON'T KNOW	9	(BOX 10)

CHQ.345 I'm going to read a list of services. For each service, please tell me if {CHILD} or your family ever received this service before this school year to help with {CHILD}'s special needs.

RESPONSES: 1=YES, 2=NO, 7=REFUSED, 9=DON'T KNOW

CAPI INSTRUCTION: DISPLAY BRACKETS [ ] AROUND FIRST PARAGRAPH [I'm special needs.] WHEN ON ITEMS B-L.

HELP AVAILABLE

a. Speech or language therapy? .....___
b. Occupational therapy? .....___
c. Physical therapy? .....___
d. Vision services? .....___
e. Social work services? .....___
f. Psychological services? .....___
g. Home visits? .....___
h. Parent support or training? .....___
i. Special class with other children some or all of whom also had special needs? .....___
j. Private tutoring or schooling for learning problems? .....___

BOX 8

CHECK ITEM CHQ.360:
- IF CHILD DOES NOT HAVE DIFFICULTY SEEING (CHQ.285=2, 7, 9) OR CHILD'S VISION PROBLEM IS CORRECTABLE WITH GLASSES (CHQ.315=1), GO TO BOX 9.
- OTHERWISE, CONTINUE WITH CHQ.345 (LETTER K).

k. Instruction in Braille? .....___

BOX 9

CHECK ITEM CHQ.367:
- IF CHILD DOES NOT HAVE DIFFICULTY HEARING (CHQ.230=2, 7, 9), GO TO CHQ.375.
- OTHERWISE, CONTINUE WITH CHQ.345 (LETTER L).

l. Instruction in sign language, Cued Speech, ASL, TOCO? .....___

CHQ.375 How old was {CHILD} when {this service/the earliest of these services} began?

CAPI INSTRUCTION: DISPLAY "THIS SERVICE" IF ONLY ONE ITEM CODED 1 (YES) FOR CHQ.345/LETTERS A-M) OR IF CHQ.340 = 1 AND EVERY ITEM AT CHQ.345 = 2, 7, OR 9. OTHERWISE, DISPLAY "THE EARLIEST OF THESE SERVICES."

CAPI INSTRUCTION: RANGE CHECK: 0-24 IF MONTHS IS THE UNIT; 0-CURRENT AGE IF YEARS IS THE UNIT.

CAPI INSTRUCTION: IF AGE = 0, SKIP THE UNIT FIELD AND GO TO CHQ.385.

|___|___|
ENTER AGE

REFUSED 77 (CHQ.385)
DON'T KNOW 99

ENTER UNIT

MONTHS 1 (CHQ.385)
YEARS 2 (CHQ.385)
REFUSED 7 (CHQ.385)
DON'T KNOW 9

CHQ.380 What is the month and year when {{CHILD} first received {NAME OF SINGLE SERVICE}/the first of these services began}?

IF R DOESN'T KNOW MONTH, ASK: DO YOU REMEMBER THE YEAR?

CAPI INSTRUCTION: DISPLAY "{CHILD} FIRST RECEIVED {NAME OF SINGLE SERVICE}" IF ONLY ONE ITEM CODED 1 (YES) FOR CHQ.345/LETTERS A-M) OR IF CHQ.340 = 1 AND EVERY ITEM AT CHQ.345 = 2, 7, OR 9. OTHERWISE, DISPLAY "THE FIRST OF THESE SERVICES BEGAN."

CAPI INSTRUCTION: DISPLAY "THIS SERVICE" FOR {NAME OF SINGLE SERVICE} IF CHQ.340 = 1 AND EVERY ITEM AT CHQ.345 = 2, 7, OR 9. OTHERWISE, DISPLAY THE NAME OF THE SERVICE CODED AT CHQ.345.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___| AND |___|___|___|___|
ENTER MONTH ENTER YEAR

REFUSED 777
DON'T KNOW.....999

CHQ.385 Is {CHILD} still receiving {this service/any of these services}?

CAPI INSTRUCTION: DISPLAY "THIS SERVICE" IF ONLY ONE ITEM CODED 1 (YES) FOR CHQ.345/LETTERS A-M) OR IF CHQ.340 = 1 AND EVERY ITEM AT CHQ.345 = 2, 7, OR 9. OTHERWISE, DISPLAY "ANY OF THESE SERVICES."

YES	1	(CHQ.400)
NO	2	
REFUSED	7	
DON'T KNOW	9	

CHQ.390 What is the month and year when {{CHILD} last received {NAME OF SINGLE SERVICE}/the last of these services was received}?

CAPI INSTRUCTION: DISPLAY "{CHILD} LAST RECEIVED {NAME OF SINGLE SERVICE}" IF ONLY ONE ITEM CODED 1 (YES) FOR CHQ.345/LETTERS A-M) OR IF CHQ.340 = 1 AND EVERY ITEM AT CHQ.345 = 2, 7, OR 9. OTHERWISE, DISPLAY "THE LAST OF THESE SERVICES WAS RECEIVED."

CAPI INSTRUCTION: DISPLAY "THIS SERVICE" FOR {NAME OF SINGLE SERVICE} IF CHQ.340 = 1 AND EVERY ITEM AT CHQ.345 = 2, 7, OR 9. OTHERWISE, DISPLAY THE NAME OF THE SERVICE CODED AT CHQ.345.

CAPI INSTRUCTION: RANGE CHECK: 1-12 FOR MONTH, 90-99 FOR YEAR.

CAPI INSTRUCTION: EDIT: MONTH AND YEAR ENTERED MUST BE EQUAL TO OR GREATER THAN CHILD'S BIRTHDATE AND LESS THAN OR EQUAL TO INTERVIEW DATE.

|___|___|	AND	|___|___|___|___|
ENTER MONTH		ENTER YEAR

REFUSED	777
DON'T KNOW	999

CHQ.400 Overall, how helpful {are/were} the special services your child or family {is receiving/received}?

CAPI INSTRUCTION: DISPLAY "ARE" AND "IS RECEIVING" IF CHQ.385 = 1. OTHERWISE DISPLAY "WERE" AND "RECEIVED".

Very helpful,	1
Helpful,	2
Not helpful, or	3
Not at all helpful?	4
REFUSED	7
DON'T KNOW	9

BOX 10

CHECK ITEM CHQ.405:

- IF CHILD HAS SIGNIFICANT DIFFICULTY WITH ARMS AND LEGS (CHQ.175=4) AND HAS RECEIVED A DIAGNOSIS OF A PROBLEM FROM A PROFESSIONAL (CHQ.185=1)
  OR
  CHILD HAS SIGNIFICANT DIFFICULTY WITH COMMUNICATION (CHQ.200=4) AND HAS RECEIVED A DIAGNOSIS OF A PROBLEM FROM A PROFESSIONAL (CHQ.215=1),
  CONTINUE WITH CHQ.410.
- OTHERWISE, GO TO BOX 11.

CHQ.410 Does {CHILD} currently use special equipment for children with special needs such as a wheelchair, communication board, or other assistive device?

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

BOX 11

CHECK ITEM CHQ.415:

- GO TO SECTION MHQ (PARENT MARITAL HISTORY).

Appendix B

From ECLS-K Base Year Instrumentation

Spring Parent Interview

Supplementary Items for Non-Response Households

SUPPLEMENTARY ITEMS – SPQ

BOX 0A

IF FRESHENED CASES, CONTINUE WITH BOX 0B. IF PREVIOUS ROUND NONRESPONSE CASES. GO TO BOX 1.

BOX 0B

IF (NumberOfChildren = 1) OR IF (NumberOfChildren > 1 and ChildNum = 1), CONTINUE WITH SPQ.001. OTHERWISE, GO TO BOX 1.

SPQ.001 Was {CHILD} enrolled in kindergarten in the United States in the fall term of the 1998 - 1999 school year?

YES	1	(BOX 7)
NO	2	(SPQ.003)
REFUSED	7	(SPQ.003)
DON'T KNOW	9	(SPQ.003)

SPQ.003 Why was {CHILD} not enrolled in kindergarten in the fall term of the 1998 - 1999 school year?

CODE ALL THAT APPLY.

DID NOT ATTEND KINDERGARTEN	1	(BOX 1)
ENROLLED IN FIRST GRADE AND RETAINED	2	(BOX 1)
PROMOTED FROM KINDERGARTEN TO FIRST GRADE IN THE CURRENT SCHOOL YEAR	3	(BOX 1)
WAS HOME-SCHOOLED LAST YEAR	4	(BOX 1)
OUT OF COUNTRY - MILITARY FAMILY	5	(BOX 1)
OUT OF COUNTRY- IMMIGRANT FAMILY	6	(BOX 1)
OTHER (SPECIFY)	91	(SPQ.003OS)
REFUSED	7	(BOX 1)
DON'T KNOW	9	(BOX 1

SPQ.003OS [Why was {CHILD} not enrolled in kindergarten in the fall term of the 1998 - 1999 school year?]

SPECIFY REASONS.

_____

BOX 1

- IF (NumberOfChildren >1 and ChildNum=2), GO TO SPQ.005.
- IF (NumberOfChildren=1) OR IF (NumberOfChildren >1 and ChildNum=1), GO TO SPQ.010.

SPQ.005 Next, I'd like to talk with you about the child care arrangements you had for {CHILD} last year.
Did {CHILD} have the same child care arrangements as {TWIN} the year before {he/she} started kindergarten?

YES	1	(SPQ.060)
NO	2	(SPQ.010)
REFUSED	7	(SPQ.060)
DON'T KNOW	9	(SPQ.060)

SPQ.010 **HELP AVAILABLE**

Did {CHILD} receive care from a relative on a **regular basis {the year before** {he/she} started kindergarten/in 1998}?

THIS MEANS ANYTIME IN THE YEAR BEFORE CHILD ENTERED KINDERGARTEN.

HELP TEXT:
Care from a relative: Record care or programs provided by someone other than the child's parents. In all cases, do not include care provided by a parent, even if they do not live in the household. (Do not include visitation with a separated or divorced parent who does not have custody.)

If there is at least one parent in the household, any relative living in the household is eligible to be counted as a care arrangement, if the care is provided on a regularly scheduled basis. Relatives outside the household may also be regular care providers.

If neither parent lives in the household, do not include care provided by guardians who live with the child (they are similar to parents).

Relative care arrangements may or may not have a charge or fee.

Regular Basis: An arrangement or program occurring on a routine schedule (i.e., occurring at least weekly or on some other schedule). Do not include occasional babysitting or "back up" arrangements that are just used once in a while.

CAPI INSTRUCTION: DISPLAY 'REGULAR BASIS THE YEAR BEFORE' IN BRIGHT WHITE. DISPLAY "in 1998" IF SPQ.003 = 1, 2, 3, OR 4. ELSE DISPLAY "the year before {he/she} started kindergarten."

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.020 **HELP AVAILABLE**

Did {CHILD} receive care from a nonrelative on a **regular basis {the year before** {he/she} started kindergarten/in 1998}?

PROBE: This refers to care received from nonrelatives in a private home, including home child care providers, regular sitters, or neighbors. However, this does not include child care centers.

THIS MEANS ANYTIME IN THE YEAR BEFORE CHILD ENTERED KINDERGARTEN.

HELP TEXT:
Care from a non-relative: Non-relative care is provided by someone not related to the child and is located in a private home. The private home may be the child's home, the caregiver's home, or another home.

If there is at least one parent in the household, any nonrelative living in the household is eligible to be counted as a care arrangement, IF the care is given on a regularly scheduled basis.

If neither parent lives in the household, do not include care provided by guardians who live with the child (they are treated the same as parents).

Non-relative care arrangements or programs may or may not have a charge or fee.

Regular Basis: An arrangement or program occurring on a routine schedule (i.e., occurring at least weekly or on some other schedule). Do not include occasional babysitting or "back up" arrangements that are just used once in a while.

CAPI INSTRUCTION: DISPLAY 'REGULAR BASIS THE YEAR BEFORE' IN BRIGHT WHITE. DISPLAY “in 1998” IF SPQ.003 = 1, 2, 3, OR 4. ELSE DISPLAY “the year before {he/she} started kindergarten.”

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.030 **HELP AVAILABLE**

Head Start is a federally sponsored preschool program primarily for children from low-income families. Did {CHILD} attend Head Start {**the year before** {he/she} started kindergarten/in 1998}?

THIS MEANS ANYTIME IN THE YEAR BEFORE CHILD ENTERED KINDERGARTEN. DISPLAY “in 1998” IF SPQ.003 = 1, 2, 3, OR 4. ELSE DISPLAY “the year before {he/she} started kindergarten.”

HELP TEXT:
Head Start: Head Start is a federally funded early childhood education program designed to improve the school-readiness of disadvantaged children (i.e., children from low-income families). Children who participate are usually 3 to 5 years old. Head Start may be offered in a school, community center, a church facility, or anywhere a nursery school may be offered.

Rarely, you may find a case in which a respondent reports that the child is in "home Head Start," that is, he/she participates in Head Start in his/her own home. Generally, this involves the parent acting as the child's teacher, supplemented by occasional home visits by a Head Start teacher and perhaps some occasional group activities at a central location.

CAPI INSTRUCTION: DISPLAY 'THE YEAR BEFORE' IN BRIGHT WHITE. DISPLAY “in 1998” IF SPQ.003 = 1, 2, 3, OR 4. ELSE DISPLAY “the year before {he/she} started kindergarten.”

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.040 **HELP AVAILABLE**

Did {CHILD} attend a day care center, nursery school or preschool on a **regular basis {the year before** {he/she} started kindergarten/in 1998}?

THIS MEANS ANYTIME IN THE YEAR BEFORE CHILD ENTERED KINDERGARTEN.

HELP TEXT:
Center-based Programs: Include any type of formal program such as nursery school, prekindergarten, preschool or a day care center. These programs may have names like "KinderCare Learning Center," or "Children's Academy."

Center-based programs may or may not have a charge or fee.

Head Start, though sometimes viewed as a center type care arrangement, is not included here. There is a separate category for Head Start.

Regular Basis: An arrangement or program occurring on a routine schedule (i.e., occurring at least weekly or on some other schedule). Do not include occasional babysitting or "back up" arrangements that are just used once in a while.

CAPI INSTRUCTION: DISPLAY 'A REGULAR BASIS THE YEAR BEFORE' IN BRIGHT WHITE. DISPLAY “in 1998” IF SPQ.003 = 1, 2, 3, OR 4. ELSE DISPLAY “the year before {he/she} started kindergarten.”

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.060 Now I have some questions about {CHILD}'s health. How much did {CHILD} weigh when {he/she} was born?

ENTER POUNDS.

CAPI INSTRUCTIONS: HARD RANGE: 1-13 FOR POUNDS.

|___|___|
ENTER POUNDS
OR

REFUSED	77	(BOX 2)
DON'T KNOW	99	(BOX 2)

SPQ.065 [How much did {CHILD} weigh when {he/she} was born?]

ENTER OUNCES.

CAPI INSTRUCTIONS: HARD RANGE: 0-16 FOR OUNCES.

|___|___|
ENTER OUNCES
OR

REFUSED	77	(BOX 2)
DON'T KNOW	99	(BOX 2)

BOX 2

- IF REFUSED OR DON'T KNOW FOR THE NUMBER OF POUNDS (SPQ.060=DK OR REFUSED)

OR

- IF THE NUMBER OF POUNDS IS 5 AND REFUSED OR DON'T KNOW FOR THE NUMBER OF OUNCES (SPQ.060= 5) AND (SPQ.065=DK OR REFUSED), CONTINUE WITH SPQ.070.

- OTHERWISE, GO TO BOX 3.

SPQ.070 When {he/she} was born, did {CHILD} weigh more than 5 1/2 pounds?

YES	1	(BOX 3)
NO	2	(SPQ.080)
REFUSED	7	(SPQ.080)
DON'T KNOW	9	(SPQ.080)

SPQ.080 Did {he/she} weigh more than 3 pounds?

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

BOX 3

- IF (NumberOfChildren=1) OR
  IF (NumberOfChildren >1 and ChildNum=1), CONTINUE WITH SPQ.090.
- IF (NumberOfChildren >1 and ChildNum=2), GO TO SPQ.110.

SPQ.090 Was {CHILD} born more than two weeks before {he/she} was due?

YES	1	(SPQ.100)
NO	2	(SPQ.110)
REFUSED	7	(SPQ.110)
DON'T KNOW	9	(SPQ.110)

SPQ.100 How many days or weeks early was {he/she}?

ENTER NUMBER.

CAPI INSTRUCTION: RANGE CHECKS: 15-31 IF DAYS IS THE UNIT; 3-16 IF WEEKS IS THE UNIT.

|___|___|
ENTER NUMBER
OR

REFUSED	77	(SPQ.110)
DON'T KNOW	99	(SPQ.110)

SPQ.105 [How many days or weeks early was {he/she}?]

ENTER UNIT.

CAPI INSTRUCTION: RANGE CHECKS: 15-31 IF DAYS IS THE UNIT; 3-16 IF WEEKS IS THE UNIT.

WEEKS	1
DAYS	2
REFUSED	7
DON'T KNOW	9

SPQ.110 Prior to kindergarten, did {CHILD} ever receive therapy services or take part in a program for children with disabilities?

CHILDREN WITH DISABILITIES INCLUDE THOSE WITH DEVELOPMENTAL DELAYS, COMMUNICATION IMPAIRMENTS, OR SPECIAL HEALTH CARE NEEDS.

YES	1	(SPQ.120A)
NO	2	(BOX 5)
REFUSED	7	(BOX 5)
DON'T KNOW	9	(BOX 5)

SPQ.120A **HELP AVAILABLE**

I'm going to read a list of services. For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.

Speech or language therapy?

HELP TEXT:
Speech or language therapy: Therapy involving the evaluation or treatment of the student's speech or language abilities. Impairments to speech can include one or more of the following: articulation errors (includes omitting words, substituting words, or distorting sounds), inappropriate voice (including pitch, loudness, or voice quality), or abnormal fluency (including, abnormal rate of speaking, speech interruptions, repetitions of sounds, words, phrases or sentences). Impairments to language can include improper use of phonemes, syntax, or semantics. Language impairments can also stem from improper practical use of language. Therapy includes special techniques to overcome speech or language limitations. Therapy should be provided only by a teacher of the speech or language impaired who is certified by the state, or by a certified Speech and Language Therapist/Pathologist.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120B **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Occupational therapy?

HELP TEXT
Occupational therapy: Therapy involving the evaluation or treatment of the student's level of independence in daily living activities. The goal of occupational therapy is to promote maximum independence in daily living. Therapy can include the use of work, play, or self-care activities to improve functional ability, promote health, prevent injury or further disability. Therapy should be provided only by a therapist who has been certified by the American Occupational Therapy Association or by an occupational therapy assistant who provides therapy under the supervision of a certified occupational therapist.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120C **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Physical therapy?

HELP TEXT:
Physical therapy: Therapy involving the evaluation or treatment of health problems resulting from injury or disease. It is also sometimes called physiotherapy. Physical therapists assess joint motion, muscle strength and endurance, how well the heart and lungs work, and how well children can do activities required for daily living. Treatment includes therapeutic exercise, cardiovascular endurance training, and training in activities of daily living, as well as the use of massage, light, cold, heat, electricity, and mechanical devices to treat physical disorders. Physical therapy does not include the use of X-ray technology. Therapy should be provided only by a therapist who has been state-certified to provide such services.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120D **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Vision services?

HELP TEXT:
Vision services: Therapy combines health and education professions to improve the student's independence in daily living and access to educational materials. Health professionals include ophthalmologists and optometrists. Ophthalmologists are medical doctors who specialize in medical and surgical care of the eyes and visual system. Optometrists are health service providers who evaluate vision conditions such as nearsightedness, farsightedness, astigmatism, and presbyopia. They test the student's ability to focus and coordinate the eyes, judge depth, and see colors accurately. They prescribe eyeglasses, contact lenses, low vision aids, and vision therapy. Teachers of the visually impaired are state-certified to teach students who are visually impaired or blind.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120E **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Social work services?

HELP TEXT:
Social work services: Services that provide support to students and their families to meet individual human needs. Particular attention is devoted to the needs and empowerment of students and their families who are disadvantaged, vulnerable, or at risk. Social workers strive to focus on the well being of the student and his/her family in the context of their school and community. Social workers attend to the environmental forces that create, contribute to, and address problems of daily living. Services should be provided only by a social worker who has been certified by the state to provide such services.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120F **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Psychological services?

HELP TEXT:
Psychological services: Services that involve the assessment of academic skills and learning aptitudes, personality and emotional development, social skills and school climates, and eligibility for special education. Treatment involves one-on-one interaction with students or parents to resolve personal conflicts and problems in learning and adjustment, psychological counseling for students and parents, social skills training, and assistance through separation and loss. Within school systems, psychological services are typically provided by certified school psychologists. However, assessment and treatment can be extended to the health community and include services provided by clinical psychologists, psychiatric social workers, or psychiatrists (who are medical doctors).

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120G **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Home visits?

HELP TEXT:
Home visits: Refer to formal visits to the homes of students by a certified health or education professional. Home visits can involve therapy or education services. Home visits are typically made by teachers of preschool or kindergarten age students with disabilities, occupational or physical therapists, school social workers, school psychologists, or regular classroom teachers.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120H **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Parent support or training?

HELP TEXT:
Parent support or training: Refer to assistance provided by the schools to parents who have students with unique educational needs, such as the student with a disability. Parent support ranges from the provision of information or referral to assistance in accessing community services for their child. Parent training can involve learning to use special instructional techniques, assistive devices (such as low vision aids) or other equipment needed by their child, or general understanding of the unique educational needs of their child.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120I **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Special class with other children some or all of whom also had special needs?

HELP TEXT:
Special class with other children some or all of whom also had special needs: Refers to a classroom with a smaller number of students than found in the regular classroom. Students in special classes have unique learning needs often resulting from a disability or limited English proficiency. All students in such classrooms require individual attention to their educational needs.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.120J **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Private tutoring or schooling for learning problems?

HELP TEXT:
Private tutoring or schooling for learning problems: Refer to education or training associated with a specific learning problem or need. The term "private" suggests either that there is a cost associated with the service or education is not sanctioned by the public school system. Individuals, organizations, or businesses in school, home, or community settings can provide private tutoring designed to improve the student's educational achievement, typically in math or reading. Special schools are available to students with particular needs such as emotional problems, learning disabilities, blindness, or deafness. Such schools charge parents for their child's education. However, the education of students with disabilities may be subsidized by their home school district if the district cannot provide a similar appropriate education.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

BOX 4A

- IF CHILD DOES NOT HAVE DIFFICULTY SEEING (SPQ.107=2, DK, REFUSED) OR
  CHILD'S VISION PROBLEM IS CORRECTABLE WITH GLASSES (SPQ.108=1), GO TO BOX 4B.
- OTHERWISE< CONTINUE WITH SPQ.120K.

SPQ.120K **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Instruction in Braille?

HELP TEXT:
Instruction in Braille: Braille is a touch system of reading using as the basic graphic symbol a cell composed of six dots, two dots wide and three dots high. The dots are "read" by running the hand over the paper rather than looking at it. Sixty-three possible dot combinations of the cell form the basis of the Braille code, and numerous rules govern the usage of the code. Learners who are totally blind, near-blind, and with profound low vision need mastery of reading Braille since it is likely their only means of gaining access to educational information in print form. Reading in Braille is a system of reading that differs in many significant ways from reading in print. Teachers receive special training to teach Braille.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

BOX 4B

IF CHILD DOES NOT HAVE DIFFICULTY HEARING (SPQ.109=2, DK, OR REFUSED), GO TO SPQ.130A.

OTHERWISE, GO TO SPQ.120L.

SPQ.120L **HELP AVAILABLE**

[For each service, please tell me if {CHILD} or your family ever received this service prior to kindergarten to help with {CHILD}'s special needs.]

Instruction in sign language, Cued speech, ASL, TOCO?

HELP TEXT:
Instruction in sign language, Cued speech, ASL, TOCO: Refers to various manual methods that replace the use of speech only as a means of communication. Manual communication is a system of teaching individuals with hearing impairments that makes use of sign language and fingerspelling. Sign language is a general term for using the hands to form words and phrases. There are many forms of sign language, including American Sign Language (ASL), Signed English, Sign Exact English (SEE), etc. Cued Speech uses hand signals to symbolize sounds. TOCO refers to total communication. TOCO employs a combination of oral and manual approaches to communication and includes speech, sign language, lip-reading, natural gestures, fingerspelling, residual hearing, reading and writing.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.130A How old was {CHILD} when {this service/the earliest of these services} began?

ENTER YEARS.

CAPI INSTRUCTION: DISPLAY 'THIS SERVICE' IF ONLY ONE ITEM CODED 1 (YES) FOR SPQ.120A-L OR IF SPQ.110=1 AND EVERY ITEM AT SPQ.120=2, DON'T KNOW, OR REFUSED. OTHERWISE, DISPLAY 'THE EARLIEST OF THESE SERVICES.

CAPI INSTRUCTION: RANGE CHECK: 0-CURRENT AGE, USING AGE AT INQ.018. IF NO DATA AT INQ.018, USE AGE AT INQ.019.

CAPI INSTRUCTION: IF NUMBER OF YEARS = AGE AT INQ.018 OR INQ.019, GO TO BOX 5. OTHERWISE, CONTINUE WITH SPQ.130B.

|___|___|
ENTER YEARS
OR

REFUSED	77	(BOX 5)
DON'T KNOW	99	(BOX 5)

SPQ.130B [How old was {CHILD} when {this service/the earliest of these services} began?]

ENTER MONTHS.

CAPI INSTRUCTION: DISPLAY 'THIS SERVICE' IF ONLY ONE ITEM CODED 1 (YES) FOR SPQ.120A-L OR IF SPQ.110=1 AND EVERY ITEM AT SPQ.120=2, DON'T KNOW, OR REFUSED. OTHERWISE, DISPLAY 'THE EARLIEST OF THESE SERVICES.'

CAPI INSTRUCTION: RANGE CHECK: 0-24 MONTHS IF SPQ.130A = 0; 1-11 MONTHS IF SPQ.130A $\geq$ 1.

|___|___|
ENTER MONTHS
OR

REFUSED	77
DON'T KNOW	99

BOX 5

- IF (NumberOfChildren =1) OR
  IF (NumberOfChildren >1 and ChildNum=1), GO TO SPQ.150.
- IF (NumberOfChildren >1 and ChildNum=2), GO TO BOX 6.

SPQ.150 When {CHILD} was born, were {his/her} biological mother and biological father married?

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.155 **HELP AVAILABLE**

Is any language other than English regularly spoken in your home?

HELP TEXT:
Regularly: A language, other than English, that is spoken on a regular basis (that is, occurring at least weekly) by at least one household member.

YES	1	(SPQ.157)
NO	2	(SPQ.160)
REFUSED	7	(SPQ.160)
DON'T KNOW	9	(SPQ.160)

SPQ.157 **HELP AVAILABLE**

What is the **primary** language spoken in your home?

HELP TEXT:
Primary language: The language spoken the most of the time by most of the household members.

CODE '15' IF RESPONDENT CAN'T CHOOSE A PRIMARY LANGUAGE.

CAPI INSTRUCTION: DISPLAY 'PRIMARY' IN BRIGHT WHITE.

ENGLISH	0
ARABIC	1
CHINESE	2
FILIPINO LANGUAGE	3
FRENCH	4
GERMAN	5
GREEK	6
ITALIAN	7
JAPANESE	8
KOREAN	9
POLISH	10
PORTUGUESE	11
SPANISH	12
VIETNAMESE	13
SOME OTHER LANGUAGE	14
(SPECIFY) _____	
RESPONDENT CANNOT CHOOSE A PRIMARY LANGUAGE	15
REFUSED	77
DON'T KNOW	99

BOX 5A

- IF CODED "14" AT SPQ.157, CONTINUE WITH SPQ 157OS.
- OTHERWISE, GO TO SPQ.160

SPQ.157OS [What is the **primary** language spoken in your home?]

SPECIFY LANGUAGE.

CAPI INSTRUCTION: DISPLAY "PRIMARY" IN BRIGHT WHITE.

SPQ.160 Next, I have a few questions about {CHILD}'s background. Was {CHILD} born in this country, that is, in any of the fifty states or the District of Columbia?

YES	1	(SPQ.200)
NO	2	(SPQ.170)
REFUSED	7	(SPQ.200)
DON'T KNOW	9	(SPQ.200)

SPQ.170 In what country or territory was {CHILD} born?

TO ACTIVATE LOOKUP, BEGIN TO TYPE COUNTRY OR TERRITORY. IF COUNTRY IS NOT ON THE LIST, HIGHLIGHT "NOT ON LIST" IN THE LOOKUP FILE AND PRESS ENTER.

USE THE ARROW KEYS TO HELP YOU LOCATE A MATCH.

CAPI INSTRUCTION: DISPLAY COUNTRY LOOKUP FILE. ALLOW 3 SPACES IN THE RESPONSE FIELD FOR ENTERING RESPONSE CODES.

BOX 5B

IF SPQ.170 = 0 (NOT ON LIST), CONTINUE WITH SPQ.170OS. OTHERWISE, GO TO SPQ.180.

SPQ.170OS [In what country was {CHILD} born?]

SPECIFY COUNTRY.

_____

SPQ.180 In what year did {CHILD} come to the United States to stay?

CAPI INSTRUCTION: RANGE CHECK: THE YEAR CHILD CAME TO U.S. CANNOT BE EARLIER THAN CHILD'S YEAR OF BIRTH OR LATER THAN THE CURRENT YEAR.

|___|___|___|___|
ENTER YEAR
OR

REFUSED	7777
DON'T KNOW	9999

SPQ.190 Is {CHILD} a U.S. citizen?

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.200 **HELP AVAILABLE**

Between {CHILD}'s birth and {when {he/she} entered kindergarten/in 1998}, did {CHILD}'s mother work outside the home for pay?

HELP TEXT:
Work for Pay: Paid work for wages, salary, commission, or pay "in kind." Examples of "pay in kind" include meals, living quarters, or supplies provided in place of wages. This definition of employment includes work in the person's own business, professional practice, or farm, paid leaves of absence (including vacations and illnesses), and work without pay in a family business or farm run by a relative. This definition excludes unpaid volunteer work (such as for a church or charity), unpaid leaves of absence, temporary layoffs (such as a strike), and work around the house.

CAPI INSTRUCTION: DISPLAY "in 1998" IF SPQ.003 = 1, 2, 3, OR 4. ELSE DISPLAY "when {he/she} entered kindergarten."

YES	1
NO	2
NO MOTHER IN HOUSEHOLD	3
REFUSED	7
DON'T KNOW	9

SPQ.210 **HELP AVAILABLE**

When {CHILD}'s mother was pregnant with {CHILD}, did she receive any WIC benefits?

HELP TEXT:
WIC: This program provides food assistance and nutritional screening to low-income pregnancy and postpartum women and their infants, as well as to low-income children up to age 5. WIC is short for the Special Supplemental Food Program for Women, Infants, and Children. WIC benefits can include food, checks, and/or vouchers.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.220 **HELP AVAILABLE**

Did {CHILD} receive any WIC benefits as an infant or child?

HELP TEXT:
WIC: This program provides food assistance and nutritional screening to low-income pregnancy and postpartum women and their infants, as well as to low-income children up to age 5. WIC is short for the Special Supplemental Food Program for Women, Infants, and Children. WIC benefits can include food, checks, and/or vouchers.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

SPQ.270 How old was {CHILD}'s biological mother when she gave birth to {CHILD}?

CAPI INSTRUCTION: RANGE CHECK: 12-55 FOR AGE IN YEARS.

|___|___|
ENTER AGE IN YEARS
OR

REFUSED	77
DON'T KNOW	99

BOX 6

GO TO PIQ (PARENT'S INVOLVEMENT WITH CHILD'S SCHOOL).

BOX 7

GO TO CMQ.

Appendix C

From ECLS-K Base Year Instrumentation

Spring Parent Interview

Home environment, activities and cognition stimulation

BOX 1

IF CHILDNUM=1 OR IF CHILDNUM=2, CONTINUE WITH HEQ.010.

HELP AVAILABLE

HEQ.010 Now I'd like to talk with you about {CHILD}'s activities with family members. In a typical **week**, how often do you or any other family member do the following things with {CHILD}?

{PROBE: Would you say not at all, once or twice, 3-6 times, or every day?}

HELP TEXT:
FAMILY MEMBER: A family member refers to any person who lives in the child's household and any relative of the child living outside the child' household.
Tell stories: Story-telling is different from reading. Stories include fairy tales, family stories, or any type of story that is not read.
Sing Songs with child: Include times that a family member sings to or with the child. This may include teaching the child songs, singing along with tapes or to the radio, or singing while playing musical instruments.
Help child with arts and crafts: Arts and crafts may include making seasonal decorations, making cutouts or drawing pictures, painting or finger-painting, whittling wood, etc. It also includes helping the child with arts and crafts projects assigned by school, but done at home.
Involve child in household chores: Chores not mentioned can also satisfy this item.
Play games or do puzzles: Includes indoor "quiet" games like board games or puzzles, or more active indoor games like Ping-Pong.
Talk about nature or do science projects: Talking about nature could include answering any questions the child may have about trees, weather, etc. or watching a television program or video about nature together and then discussing it. Science projects include any type of project designed to show the child how the world works, such as understanding how plants grow, studying rocks, using flashlights to create shadows, or mixing paints to create different colors.
Build something or play with construction toys: This would include activities that the child does with family members, such as making a tent, constructing a toy car, building a doghouse, and using Lincoln logs, Brio, or other construction toys or tools.
Play a sport or exercise together: This includes calisthenics, riding bicycles, rollerblading, individual or team sports, games like hide-and-go-seek, or other outdoor activities where activity or exercise is involved. Do not include times when the child does the sport or activity by himself.
Read books: Include only times family members have read books to the child. Do not include times when the child reads or looks at books by him or herself.

CAPI INSTRUCTION:

1. WHEN ON B-J. DISPLAY "PROBE everyday?" OTHERWISE, USE A NULL DISPLAY.

2. DISPLAY "NOW {CHILD}?" IN SQUARE BRACKETS WHEN ON B-J.

3. IF HEQ.010j = 2, 3, OR 4, CONTINUE WITH HEQ.015. OTHERWISE, GO TO BOX 3.

		NOT AT ALL	ONCE OR TWICE	3-6 TIMES	EVERY DAY	REF	DK
a.	Tell stories to {CHILD}? Would you say not at all, once or twice, 3-6 times, or every day?	1	2	3	4	7	9
b.	Sing songs with {CHILD}?	1	2	3	4	7	9
c.	Help {CHILD} to do arts and crafts?	1	2	3	4	7	9
d.	Involve {CHILD} in household chores, like cooking, cleaning, setting the table, or caring for pets?	1	2	3	4	7	9
e.	Play games or do puzzles with {CHILD}?	1	2	3	4	7	9
f.	Talk about nature or do science projects with {CHILD}?	1	2	3	4	7	9

		NOT AT ALL	ONCE OR TWICE	3-6 TIMES	EVERY DAY	REF	DK
g.	Build something or play with construction toys with {CHILD}?	1	2	3	4	7	9
h.	Play a sport or exercise together?	1	2	3	4	7	9
i.	Practice reading, writing or working with numbers?	1	2	3	4	7	9
j.	Read books to {CHILD}?	1	2	3	4	7	9

HEQ.015 Generally, how long is {CHILD} read to at each of these times?

CAPI INSTRUCTION: HARD RANGE CHECK: 1-60 MINUTES.

|___|___|
ENTER MINUTES
or
REFUSED 77
DON'T KNOW 99

BOX 3

IF (NumberOfChildren = 1) OR IF (NumberOfChildren > 1 AND ChildNum = 1), CONTINUE WITH HEQ.020. OTHERWISE, GO TO HEQ.030.

HELP AVAILABLE

HEQ.020 About how many children's books does {CHILD} have in your home now, including library books? Please only include books that are for children.

HELP TEXT:
NUMBER OF CHILDREN'S BOOKS: This item asks about the books that belong to the child, not all books in the home (e.g., not parents' books). Books shared by siblings may be counted. For example, if the children share 50 books, count all 50.

CAPI INSTRUCTION: HARD RANGE CHECK: 0-5000 BOOKS.

|__|__|__|__|
ENTER # OF BOOKS
OR
REFUSED 7777
DON'T KNOW 9999

HEQ.022. Do you have a library card?

YES 1
NO 2
REFUSED 7
DON'T KNOW 9

HEQ.024. Does {CHILD} have {his/her} own library card?

YES 1
NO 2
REFUSED 7
DON'T KNOW 9

HEQ.026 In the past **month**, that is, since {MONTH} {DAY}, has anyone in your family visited a library with {CHILD}?

CAPI INSTRUCTION: DISPLAY PREVIOUS MONTH FOR {MONTH} AND DATE OF INTERVIEW FOR {DAY}.

CAPI INSTRUCTION: DISPLAY "MONTH" IN BRIGHT WHITE.

YES	1	(HEQ.030)
NO	2	(HEQ.028)
REFUSED	7	(HEQ.028)
DON'T KNOW	9	(HEQ.028)

HEQ.028 How about in the past **year**? Has anyone in your family visited a library with {CHILD}?

CAPI INSTRUCTION: DISPLAY "year" IN BRIGHT WHITE.

YES	1
NO	2
REFUSED	7
DON'T KNOW	9

HEQ.030 In the past **week**, how often did {CHILD} read to (himself/herself) or to others outside of school?

Would you say

CAPI INSTRUCTION: DISPLAY "WEEK" IN BRIGHT WHITE.

Never	1
One or twice a week	2
Three to six times a week, or	3
Every day?	4
REFUSED	7
DON'T KNOW	9

HEQ.040 Do you have a home computer that {CHILD} uses?

YES	1	(HEQ.045)
NO	2	(HEQ.060)
REFUSED	7	(HEQ.060)
DON'T KNOW	9	(HEQ.060)

HEQ.045 In an average week, how often does {CHILD} use the computer? Would you say

Never	1	(HEQ.060)
One or twice a week	2	(HEQ.050)
Three to six times a week, or	3	(HEQ.050)
Every day?	4	(HEQ.050)
REFUSED	7	(HEQ.060)
DON'T KNOW	9	(HEQ.060)

HEQ.050 In an average week, how often does {CHILD} use the computer for educational purposes, such as to improve reading or math skills? Would you say

Never	1
One or twice a week	2
Three to six times a week, or	3
Every day?	4
REFUSED	7
DON'T KNOW	9

HEQ.060 Outside of school hours, has {CHILD} ever participated in:

		YES	NO	REF	DK
a.	Dance lessons?	1	2	7	9
a.	Organized athletic activities, like basketball, soccer, baseball, or gymnastics?	1	2	7	9
b.	Organized clubs or recreational programs, like scouts?	1	2	7	9
c.	Music lessons, for example, piano, instrumental music or singing lessons?	1	2	7	9
d.	Art classes or lessons, for example, painting, drawing, sculpturing?	1	2	7	9
e.	Organized performing arts programs, such as children's choirs, dance programs, or theater performances?	1	2	7	9

HEQ.063 Is {CHILD} tutored on a regular basis, by someone other than you or a family member, in a specific subject, such as reading, math, science, or a foreign language?

YES	1	(HEQ.065)
NO	2	(HEQ.070a)
REFUSED	7	(HEQ.070a)
DON'T KNOW	9	(HEQ.070a)

HEQ.065 What is {CHILD} tutored in?

CODE ALL THAT APPLY.

PROBE: Anything else?

READING	1	(HEQ.070a)
MATH	2	(HEQ.070a)
SCIENCE	3	(HEQ.070a)
FOREIGN LANGUAGE	4	(HEQ.070a)
OTHER (SPECIFY)	91	(HEQ.065OS)
REFUSED	7	(HEQ.070a)
DON'T KNOW	9	(HEQ.070a)

HEQ.065OS [What is {CHILD} tutored in?]

SPECIFY SUBJECT.

HELP AVAILABLE

HEQ.070 I'm going to read some statements about things that may occur in your family. In a typical **week**, please tell me the number of days

a. At least some of the family eats breakfast together.
b. {CHILD} has breakfast at a regular time.
c. Your family eats the evening meal together.
d. The evening meal is served at a regular time.

CAPI INSTRUCTIONS:

1. DISPLAY "HELP AVAILABLE" WHEN ON B AND D. DISPLAY THE FOLLOWING HELP TEXT: "Regular means generally around the same time."

2. WHEN ON B-D. DISPLAY "I'm going days" IN SQUARE BRACKETS.

3. DISPLAY "WEEK" IN BRIGHT WHITE.

4. HARD RANGE CHECK: 0-7 DAYS.

|___|
NUMBER OF DAYS
OR
REFUSED 77
DON'T KNOW 99

HEQ.080 On weeknights during the school year, does {CHILD} usually go to bed at about the same time each night, or does {his/her} bedtime vary a lot from night to night?

HAS USUAL BEDTIME.....	1	(HEQ.085)
BEDTIME VARIES.....	2	(BOX 4)
REFUSED.....	7	(BOX 4)
DON'T KNOW.....	9	(BOX 4)

HEQ.085 About what time does {CHILD} usually go to bed?

ENTER HOUR: MINUTE.

CAPI INSTRUCTION: RANGE CHECK: LOWER RANGE: 1:00. UPPER RANGE: 12:59.

|___|___| - |___|___|
HOUR MINUTE
or

REFUSED.....	77	(HEQ.090)
DON'T KNOW.....	99	(HEQ.090)

HEQ.087 [About what time does {CHILD} usually go to bed?]

SELECT A.M. OR P.M.

A.M.	1
P.M.	2
REFUSED.....	7
DON'T KNOW.....	9

BOX 4

IF (NumberOfChildren = 1) OR IF (NumberOfChildren > 1 AND ChildNum = 1), CONTINUE WITH HEQ.090. OTHERWISE, GO TO BOX 5.

HEQ.090 Now, I have some questions about your neighborhood. How safe is it for children to play outside during the day in your neighborhood?

Would you say it's

not at all safe,	1
somewhat safe, or	2
very safe?	3
REFUSED	7
DON'T KNOW	9

BOX 5

GO TO SSQ (SOCIAL SKILLS, PROBLEM BEHAVIORS, AND APPROACHES TOWARD LEARNING).

Appendix D

From ECLS-K Base Year Instrumentation

School Administrator Questionnaire

III. Community Characteristics and School Safety

III. COMMUNITY CHARACTERISTICS AND SCHOOL SAFETY

30. Which of these best describes the community in which this school is located? CIRCLE ONLY ONE.

A rural or farming community? 01

A small city or town of fewer than 50,000 people that is not a suburb of a larger city? 02

A medium-sized city (50,000 to 100,000) people? 03

A suburb of a medium-sized city? 04

A large city (100,001 to 500,000 people)? 05

A suburb of a large city? 06

A very large city (over 500,000 people)? 07

A suburb of a very large city 08

Military base or station? 09

Indian reservation? 10

31. How much of a problem are the following in the neighborhood where this school is located? CIRCLE ONE NUMBER ON EACH LINE.

	Big problem	Somewhat of a problem	No problem	Don't know
a. Tensions based on racial, ethnic, or religious differences?	1	2	3	4
b. Garbage, litter, or broken glass in the street or road, on the sidewalks, or in yards?	1	2	3	4
c. Selling or using drugs or excessive drinking in public?	1	2	3	4
d. Gangs?	1	2	3	4
e. Heavy traffic?	1	2	3	4
f. Violent crimes like drive-by shootings?	1	2	3	4
g. Vacant houses and buildings?	1	2	3	4
h. Crime in the neighborhood?	1	2	3	4

32. Have any of the following things happened ***during this school year*** at this school? CIRCLE ONE NUMBER ON EACH LINE.

		Yes	No
a.	Children bringing weapons to school?	1	2
b.	Things being taken directly from children or teachers by force or threat of force at school or on the way to or from school?	1	2
c.	Children or teachers being physically attacked or involved in fights?	1	2

33. Does your school take any of the following measures to ensure the safety of children? CIRCLE ONE NUMBER ON EACH LINE.

		Yes	No
a.	Security guards?	1	2
b.	Metal detectors?	1	2
c.	Locked exterior doors during the day?	1	2
d.	A requirement that visitors sign in?	1	2
e.	Limits on going to the restrooms?	1	2
f.	Teachers assigned to supervise the hallways?	1	2
g.	Hall passes required to leave class?	1	2

Appendix E

From ECLS-K Base Year Instrumentation

Student Record Abstract Form

OMB NO. 1850-0719
App. Ex.: 11/30/99

ECLS-K
STUDENT RECORDS ABSTRACT FORM
SPRING 1999

Prepared for the U.S. Department of Education
National Center for Education Statistics

by Westat
1650 Research Boulevard
Rockville, Maryland 20850
(301) 251-1500

Assurance of Confidentiality

The collection of information in this survey is authorized by Public Law 100-297 and continued under the auspices of Section 404(a) of the National Education Statistics Act of 1994, Title IV of the Improving America's Schools Act of 1994, Public Law 103-382. Participation is voluntary. You may skip questions you do not wish to answer; however, we hope that you will answer as many questions as you can. No information collected under this authority may be used for any purpose other than the purpose for which it was supplied. Information will be protected from disclosure by federal statute (42 US Code 242m, section 308d). Data will be combined to produce statistical reports. No individual data that links your name, address, telephone number, or identification number with your responses will be reported.

Instructions for completing this form.

This form is an important part of a major longitudinal study of children's early educational experiences beginning with kindergarten and continuing through grade 5.

This form collects information from student records regarding attendance, whether or not the child has IEP on record, and home language.

Please complete this form for the child whose name appears on the label on the cover. Please write your answers directly on the form by circling the appropriate number or by writing your responses in the space provided.

Thank you very much for your help.

1. Write the date the child Entered School: ____/____/____
MO DAY YR

2. Write the date the child Left School: ____/____/____
MO DAY YR

3. Why did the child leave:

Transferred ..... 1 (GO TO 3A)
Other (Specify) _____ 2
Unknown 3

3a. Please record the school name and address into which this child transferred:

_____
School Name

_____
School Address

_____
City State Zip Code

_____
(Area Code) Telephone Number

4. Did child repeat a grade during the academic year?

Yes 1
No 2

5. Does this school keep attendance records?

Yes ..... 1 (COMPLETE THE ATTENDANCE RECORD TABLE BELOW)
No ..... 2 (GO TO 7)

TERM TYPE CIRCLE ONE	DATES OF TERM	NUMBER OF DAYS IN TERM	ATTENDANCE RECORDS	
			ABSENCES	TARDIES
1st Quarter..... 1 1st Semester.... 2 1st Trimester.... 3 Full Year 4	___/___/___ to ___/___/___ MO DA YR MO DA YR	_____ #DAYS	Total _____ Excused _____ Unexcused _____	Total _____ Excused _____ Unexcused _____
2nd Quarter..... 1 2nd Semester .. 2 2nd Trimester... 3	___/___/___ to ___/___/___ MO DA YR MO DA YR	_____ #DAYS	Total _____ Excused _____ Unexcused _____	Total _____ Excused _____ Unexcused _____
3rd Quarter ..... 1 3rd Trimester ... 2	___/___/___ to ___/___/___ MO DA YR MO DA YR	_____ #DAYS	Total _____ Excused _____ Unexcused _____	Total _____ Excused _____ Unexcused _____
4th Quarter..... 1	___/___/___ to ___/___/___ MO DA YR MO DA YR	_____ #DAYS	Total _____ Excused _____ Unexcused _____	Total _____ Excused _____ Unexcused _____

6. What is the school's definition of an excused absence or tardy? _____

_____

_____

_____

7. Does this child have an IEP/IFSP on record with the school?

Yes 1
No ..... 2 (SKIP TO 11)

8. For which academic school year does the child have at least one IEP on record? CIRCLE ALL YEARS FOR WHICH THE CHILD HAS AN IEP. IF MORE THAN ONE IEP COVERS THE SAME SCHOOL YEAR, RECORD THE EARLIEST DATE FOR THAT YEAR.

		Write Month and Year IEP was signed
1998-1999	1	____/_____
1997-1998	2	____/_____
1996-1997	3	____/_____
1995-1996	4	____/_____
1994-1995	5	____/_____
1993-1994	6	____/_____
1992-1993	7	____/_____
1991-1992	8	____/_____

9. What is the disability classification listed on the most current IEP/IFSP? CIRCLE ALL THAT APPLY. WRITE THE DISABILITY CLASSIFICATION IN THE SPACE BELOW IF IT DOES NOT EXACTLY MATCH ONE OF THE CODES PROVIDED.

Learning Disability	01	Physically Impaired	08
Serious Emotional Disturbance	02	Multiple Impairments	09
Speech or Language Impaired	03	Deaf and Blind	10
Mental Retardation	04	Developmental Delay	11
Visually Impaired (Blind)	05	Autism	12
Hearing Impaired (Deaf)	06	Traumatic Brain Injury	13
Health Impaired	07	Other, Specify (WRITE DESCRIPTION BELOW)	14

_____
_____
_____
_____
_____
_____
_____

10. For the child's current IEP/IFSP, was the child's primary placement a general education classroom?

Yes 1
No 2
Couldn't tell 3

11. Is a copy of the child's most current IEP/IFSP enclosed with this abstract form?

Yes 1
No 2 (12)

12. Why not?

_____

_____

_____

13. Which type of Language/English Proficiency Screening does the school use?

Home Language Survey..... 1
Other (Specify) _____ 2
None .... 3 (GO TO 17)

		YES	NO
14.	Is a language other than English used in the home?	1	2
15.	Does the student have a first language other than English?	1	2
16.	Does the student most frequently speak a language other than English?	1	2

17. Did the child attend Head Start before entering kindergarten?

Yes 1
No 2

18. What is the name, address and telephone number of the Head Start center the child attended?

_____ _____
CENTER NAME CENTER ID

_____
CENTER ADDRESS

_____
CITY STATE ZIP CODE

_____
(AREA CODE) TELEPHONE NUMBER

19. What is the name of the Head Start center director?

_____
CENTER DIRECTOR NAME

20. Is a copy of the child's report card enclosed with this abstract form?

Yes 1
No 2 (18)

21. Why not?

_____

_____

Appendix F

Network Affiliation Matrices

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
		Li	Pl	Mu	Zo	Ob	Da	Pa	Cl	Mu	Dr	Ar	Pa	Cr	No	Cu	Sp	Oc	Ph	Vi	So	Ps	Ho	Pa	Sp	Tu	Si	Ot	He
1	Library	3	1	1	1	0	0	0	0	0	0	0	0	0	2	2	2	1	0	1	1	1	2	0	0	0	0	0	0
2	Play	1	2	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0
3	Museum	1	0	3	3	2	0	0	1	0	0	0	0	0	3	3	3	1	1	1	1	1	0	1	3	1	0	0	0
4	Zoo	1	0	3	4	2	0	1	1	0	0	0	0	0	4	4	3	1	1	1	1	0	1	4	1	0	0	0	0
5	Observed_Sport	0	0	2	2	3	0	0	1	0	0	0	0	0	2	3	2	1	1	1	1	0	1	2	1	0	0	0	0
6	DanceLessons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Participate_in_Sports	0	1	0	1	0	0	2	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	1	1	0	0	0	0
8	Club	0	0	1	1	1	0	0	1	0	0	0	0	0	1	1	1	0	1	1	0	0	0	1	1	0	0	0	0
9	Music_Lessons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Drama_Classes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Art_Lessons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Participate_in_Organized_Performing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Craft_Classes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Nonenglish_Instruction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Cultural_Event	2	1	3	4	2	0	2	1	0	0	0	0	0	6	6	5	2	1	2	2	1	2	5	2	0	0	0	0
16	Speech	2	1	3	4	3	0	2	1	0	0	0	0	0	6	10	7	3	1	3	3	3	3	7	4	1	1	0	0
17	Occupational	2	1	3	3	2	0	1	1	0	0	0	0	0	5	7	7	3	1	3	3	3	3	6	4	1	1	0	0
18	Physical	1	0	1	1	1	0	0	0	0	0	0	0	0	2	3	3	3	0	1	2	2	1	3	2	0	0	0	0
19	Vision	0	0	1	1	1	0	0	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0	1	1	0	0	0	0
20	Socialwork	1	0	1	1	1	0	0	1	0	0	0	0	0	2	3	3	1	1	3	2	2	3	3	1	1	1	0	0
21	Psychological	1	0	1	1	1	0	0	0	0	0	0	0	0	2	3	3	2	0	2	3	2	2	3	2	1	1	0	0
22	Homevisits	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	2	0	2	2	3	2	3	2	1	1	0	0
23	Parentsupport	1	0	1	1	1	0	0	1	0	0	0	0	0	2	3	3	1	1	3	2	2	3	3	1	1	1	0	0
24	Specialneedsclass	2	0	3	4	2	0	1	1	0	0	0	0	0	5	7	6	3	1	3	3	3	3	7	3	1	1	0	0
25	Tutoring	0	1	1	1	1	0	1	0	0	0	0	0	0	2	4	4	2	0	1	2	2	1	3	4	1	1	0	0
26	Signlanguage	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0
27	Other_Therapy	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	0	0
28	Head_Start	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure A.1

Autism affiliation network

Figure A.2

Deaf/Hard of hearing affiliation matrix

		1 Li	2 Pl	3 Mu	4 Zo	5 Ob	6 Da	7 Pa	8 Cl	9 Mu	10 Dr	11 Ar	12 Pa	13 Cr	14 No	15 Cu	16 Sp	17 Oc	18 Ph	19 Vi	20 So	21 Ps	22 Ho	23 Pa	24 Sp	25 Tu	26 Si	27 Ot	28 He
1	Library	16	4	4	5	5	1	5	1	0	1	0	4	1	1	8	6	4	4	1	2	2	5	5	4	3	0	3	4
2	Play	4	10	3	3	5	0	1	0	0	0	0	3	1	0	5	5	3	4	2	3	2	3	2	4	1	0	1	5
3	Museum	4	3	6	2	1	0	2	1	0	0	0	1	0	0	3	5	3	1	1	1	1	2	0	2	0	0	0	3
4	Zoo	5	3	2	10	2	0	2	1	1	0	0	3	1	0	5	5	3	2	1	1	1	2	3	4	2	0	1	5
5	Observed_Sport	5	5	1	2	12	0	2	1	1	0	0	2	1	0	4	6	2	1	1	1	2	3	3	2	1	0	1	3
6	DanceLessons	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Particpate_in_Sports	5	1	2	2	2	0	8	0	0	1	0	2	0	0	1	4	3	2	1	2	1	2	3	2	1	0	0	2
8	Club	1	0	1	1	1	0	0	2	0	1	0	0	0	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0
9	Music_Lessons	0	0	0	1	2	0	1	0	2	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0
10	Drama_Classes	1	1	0	1	1	0	1	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0
11	Art_Lessons	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0
12	Participate_in_Organized_Performing	4	3	1	3	2	0	2	0	0	0	0	6	1	0	4	2	1	1	2	0	0	1	1	1	0	0	0	3
13	Craft_Classes	1	1	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0
14	Nonenglish_Instruction	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
15	Cultural_Event	8	5	3	5	4	1	4	1	0	0	0	4	0	1	16	6	2	2	1	1	1	4	4	3	1	0	0	6
16	Speech	6	5	1	5	6	0	3	1	1	0	0	2	1	0	6	17	9	9	2	2	2	4	4	3	1	0	0	6
17	Occupational	4	3	1	3	2	0	2	1	1	0	0	2	1	0	9	9	8	5	2	2	2	3	3	3	1	0	0	5
18	Physical	4	4	1	2	2	0	1	0	0	0	0	1	0	0	2	8	5	9	1	4	2	4	4	4	2	0	0	2
19	Vision	1	2	1	1	1	0	1	0	0	0	0	2	1	0	1	3	2	1	3	2	1	2	2	2	1	0	0	1
20	Socialwork	2	3	1	1	1	0	1	0	0	0	0	2	1	0	1	6	2	1	3	8	4	5	4	2	1	0	0	3
21	Psychological	2	2	1	1	2	0	2	1	1	0	0	3	1	0	5	4	2	1	2	6	4	6	4	4	2	0	1	3
22	Homevisits	5	3	0	2	3	0	1	0	0	0	0	1	0	0	4	6	3	2	1	4	5	6	4	3	1	0	0	3
23	Parentsupport	5	2	0	2	3	0	2	0	0	0	0	1	0	0	3	6	3	2	1	4	2	6	8	6	3	0	0	2
24	Specialneedsclass	4	4	2	4	2	0	2	1	0	0	0	1	0	0	3	9	6	4	2	5	3	6	6	7	3	0	0	2
25	Tutoring	3	1	0	2	1	0	1	0	0	0	0	1	0	0	1	4	3	1	1	2	1	2	3	3	10	0	0	1
26	Signlanguage	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	2	3	4	3	0	0	1
27	Other_Therapy	3	1	0	1	1	0	0	0	0	0	0	0	0	0	2	5	4	4	1	3	1	4	4	2	1	0	0	1
28	Head_Start	4	5	3	5	3	0	2	0	0	0	0	3	0	0	6	5	2	2	1	3	3	3	2	1	3	0	0	0

Figure A.3

Developmental delay affiliation matrix

		1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
		0	1	2	3	4	5	6	7	8	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8
		L	P	M	Z	O	D	P	C	M	D	A	P	C	N	C	S	O	P	V	S	P	H	P	S	T	S	O	H
1	Library	6	2	2	3	3	1	5	3	0	1	0	1	1	0	0	1	2	1	1	0	0	0	1	1	0	0	0	1
2	Play	2	3	1	2	2	0	2	1	1	1	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
3	Museum	2	1	4	4	1	1	0	2	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1
4	Zoo	3	2	4	5	1	1	0	3	2	1	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	1
5	Observed_Sport	3	2	1	1	4	1	3	2	1	1	0	0	1	0	0	1	2	1	1	0	0	0	1	1	0	0	0	1
6	DanceLessons	1	0	0	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Participate_in_Sports	5	2	2	3	3	1	6	3	0	1	0	0	1	0	0	1	2	1	1	0	0	0	1	1	0	0	0	1
8	Club	3	1	1	2	2	1	3	4	0	1	0	0	1	0	0	1	2	1	1	0	0	0	1	1	0	0	0	1
9	Music_Lessons	0	1	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Drama_Classes	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Art_Lessons	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Participate_in_Organized_Performing	1	0	0	0	0	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Craft_Classes	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Nonenglish_Instruction	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Cultural_Event	1	1	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Speech	2	1	2	2	2	0	2	2	0	1	0	0	1	0	0	1	2	1	1	0	0	0	1	1	0	0	0	1
17	Occupational	1	0	0	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Physical	1	0	1	1	1	1	0	1	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Vision	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Socialwork	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Psychological	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Homevisits	1	0	1	1	1	1	0	1	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Parentsupport	1	0	0	1	1	1	0	0	2	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Specialneedsclass	1	0	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Tutoring	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Signlanguage	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	Other_Therapy	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	Head_Start	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure A.4

Health impairment affiliation matrix

Figure A.5

Learning disability affiliation matrix

		1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
		L	P	M	Z	O	D	P	C	M	D	A	P	C	N	C	S	O	P	V	S	P	H	P	S	T	S	O	H		
1	Library	6	1	2	3	3	0	1	0	0	1	1	0	0	1	4	3	2	1	0	2	2	1	0	2	3	1	1	0	1	1
2	Play	1	3	1	3	1	0	1	0	0	1	1	0	0	2	2	2	2	1	1	1	0	0	2	1	1	0	0	1	0	1
3	Museum	2	1	3	2	1	0	0	0	0	0	1	1	0	0	2	1	1	0	0	1	1	0	0	2	1	1	0	0	1	0
4	Zoo	3	3	2	5	1	0	0	0	0	0	1	1	0	0	3	2	2	1	1	1	1	0	0	2	1	1	0	0	1	0
5	Observed_Sport	3	1	1	1	3	0	0	1	0	0	1	1	0	0	2	3	2	2	1	1	1	0	0	2	3	1	1	1	0	0
6	DanceLessons	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	2	1	0	0	0	2	1	0	0	2	1	1	0	0	1
7	Particpate_in_Sports	1	1	0	1	1	0	0	5	0	0	0	1	1	0	0	2	3	2	2	0	0	1	1	1	3	2	1	0	0	1
8	Club	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	3	2	2	0	0	1	1	0	2	1	1	0	0	1
9	Music_Lessons	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	3	2	2	0	0	1	1	0	2	1	1	0	0	1
10	Drama_Classes	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	3	2	2	0	0	1	1	0	2	1	1	0	0	1
11	Art_Lessons	1	1	0	1	1	0	0	1	0	0	1	1	0	0	0	2	3	2	2	0	0	1	1	0	2	1	1	0	0	1
12	Participate_in_Organized_Performing	1	0	1	1	1	0	0	1	0	0	2	0	0	0	1	1	1	0	0	0	1	1	0	0	1	1	0	0	0	1
13	Craft_Classes	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	3	2	2	0	0	1	1	0	2	1	1	0	0	1
14	Nonenglish_Instruction	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	2	3	2	2	0	0	1	1	0	2	1	1	0	0	1
15	Cultural_Event	4	2	2	3	2	0	0	2	0	0	1	1	0	0	6	4	3	2	1	1	1	0	0	2	3	1	1	0	0	1
16	Speech	3	2	1	2	3	0	0	3	0	0	1	1	0	0	4	6	4	3	2	1	1	0	0	2	3	1	1	0	0	1
17	Occupational	2	2	1	2	2	0	0	2	0	0	1	1	0	0	3	4	4	3	2	1	1	0	0	2	3	1	1	0	0	1
18	Physical	1	2	0	2	1	0	0	2	0	0	1	1	0	0	2	3	3	3	2	1	1	0	0	2	3	1	1	0	0	1
19	Vision	0	1	0	1	1	0	0	1	0	0	1	1	0	0	1	2	3	3	2	1	1	0	0	2	3	1	1	0	0	1
20	Socialwork	2	1	0	1	2	0	0	1	0	0	1	1	0	0	1	2	3	3	2	1	1	0	0	2	3	1	1	0	0	1
21	Psychological	2	1	0	1	2	0	0	1	0	0	1	1	0	0	1	2	3	3	2	1	1	0	0	2	3	1	1	0	0	1
22	Homevisits	1	0	0	1	1	0	0	1	0	0	1	1	0	0	1	2	3	3	2	1	1	0	0	2	3	1	1	0	0	1
23	Parentsupport	2	0	1	0	2	0	0	1	0	0	1	1	0	0	1	3	4	3	2	1	1	0	0	2	4	1	1	0	0	1
24	Specialneedsclass	3	2	1	2	3	0	0	3	0	0	1	1	0	0	4	6	4	4	3	1	2	2	1	1	6	2	1	0	0	1
25	Tutoring	1	1	0	1	1	0	0	2	0	0	1	1	0	0	2	4	3	2	2	0	1	1	0	0	3	2	1	0	0	1
26	Signlanguage	1	1	0	1	1	0	0	1	0	0	1	1	0	0	2	3	3	2	1	1	1	0	0	2	3	1	1	0	0	1
27	Other_Therapy	0	0	0	1	1	0	0	1	0	0	1	1	0	0	1	2	3	3	2	1	1	0	0	2	3	1	1	0	0	1
28	Head_Start	1	0	1	0	1	0	0	1	0	0	1	1	0	0	1	2	3	3	2	1	1	0	0	2	3	1	1	0	0	1

Figure A.6

Mental retardation affiliation matrix

Figure A.7

Multiple impairments affiliation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1		3	1	1	1	1	0	1	1	1	0	1	0	0	0	2	2	2	0	0	0	0	1	1	1	1	0	0	0
2	Library	1	3	2	1	1	2	0	1	1	2	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
3	Play	1	2	2	1	1	2	0	1	1	2	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
4	Museum	1	1	1	1	1	2	0	1	1	2	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
5	Zoo	1	1	1	1	1	2	0	1	1	2	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
6	Observed_Sport	1	2	2	1	3	0	1	1	2	0	0	0	0	0	2	2	1	1	1	0	0	1	1	0	0	1	1	0
7	DanceLessons	0	0	0	0	1	1	1	1	2	0	0	0	0	0	2	2	1	1	1	0	0	1	1	0	0	1	1	0
8	Particpate_in_Sports	1	1	1	0	1	0	2	0	1	1	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
9	Club	1	1	1	1	1	1	0	0	1	1	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
10	Music_Lessons	1	2	2	2	1	2	0	1	1	2	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
11	Drama_Classes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Art_Lessons	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
13	Participate_in_Organized_Performing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Craft_Classes	0	1	1	0	1	0	0	1	1	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
15	Nonenglish_Instruction	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
16	Cultural_Event	2	1	1	1	2	0	1	1	0	1	0	0	0	0	3	2	0	0	0	2	1	1	0	2	2	0	0	0
17	Speech	2	0	1	0	1	1	0	0	1	1	0	0	0	0	2	1	0	0	0	2	1	1	0	2	2	0	0	0
18	Occupational	2	2	2	1	3	0	1	1	2	0	0	1	0	0	2	3	0	0	0	3	4	5	0	5	5	1	1	0
19	Physical	3	2	2	1	3	0	2	1	2	0	0	1	0	0	3	4	0	0	0	4	5	6	1	1	1	1	1	0
20	Vision	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
21	Socialwork	0	1	1	1	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
22	Psychological	0	1	1	1	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
23	Homevisits	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	2	1	0	1	1	0	0	0
24	Parentsupport	1	1	1	0	2	0	0	2	0	1	0	0	0	0	2	2	0	0	0	2	1	2	0	3	3	0	0	0
25	Specialneedsclass	2	1	1	0	2	0	0	2	0	1	0	0	0	0	2	4	0	0	0	4	4	5	1	1	1	1	1	0
26	Tutoring	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	2	0	0	0
27	Signlanguage	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0
28	Other_Therapy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Head_Start	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure A.8

Physical impairments affiliation matrix

Figure A.9

Serious emotional disturbance affiliation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
		Lib	Pla	Mus	Zoo	Obs	Dan	Par	Clu	Mus	Dra	Art	Par	Cra	Non	Cul	Spe	Occ	Phy	Vis	Soc	Psy	Hom	Par	Spe	Tut	Sig	Oth	Hea
1	Library	125	49	34	63	65	12	60	12	8	1	10	14	11	1	74	49	8	6	6	4	10	8	13	19	5	1	7	21
2	Play	49	83	18	40	44	8	34	7	4	0	9	9	9	2	44	35	6	5	5	4	7	6	8	17	6	1	1	14
3	Museum	34	18	46	18	15	6	25	6	6	0	7	8	6	3	28	14	6	4	5	2	5	3	6	14	3	0	3	8
4	Zoo	63	40	18	89	44	9	42	6	4	1	6	8	9	1	55	29	6	4	3	2	4	2	6	10	3	0	4	8
5	Observed_Sport	65	44	15	44	97	7	55	14	7	2	6	11	7	3	58	43	7	4	5	2	8	8	10	15	5	2	6	16
6	DanceLessons	12	8	6	9	9	17	14	5	7	1	9	4	3	1	8	8	1	1	2	1	1	1	2	2	1	0	1	12
7	Participate_in_Sports	60	34	7	42	55	14	95	24	1	0	3	13	13	1	55	35	8	4	4	3	7	6	9	12	3	1	5	11
8	Club	12	8	4	6	6	5	14	1	8	0	9	5	3	1	12	9	2	1	1	0	1	1	3	5	1	1	2	7
9	Music_Lessons	8	4	4	6	5	2	7	1	3	1	6	3	3	1	5	2	0	0	1	0	0	0	1	1	1	0	2	0
10	Drama_Classes	1	0	0	1	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Art_Lessons	10	9	0	7	6	2	9	3	3	1	12	6	4	2	9	4	1	1	1	0	1	0	2	3	1	0	1	1
12	Participate_in_Organized_Performing	14	9	6	8	11	4	13	5	3	0	4	21	6	0	14	7	1	0	0	0	0	0	2	3	0	0	2	2
13	Craft_Classes	11	11	5	9	7	3	13	5	3	0	4	6	16	1	12	6	1	1	1	0	1	1	3	3	0	0	1	1
14	Nonenglish_Instruction	1	2	1	3	2	1	1	1	1	0	2	0	1	5	3	1	0	0	0	0	0	0	0	1	0	0	0	0
15	Cultural_Event	74	44	28	55	58	8	55	12	1	1	9	14	12	3	124	39	10	15	12	7	12	8	14	18	4	1	2	18
16	Speech	49	35	14	29	43	8	35	12	2	0	3	7	6	1	39	84	17	12	15	9	19	8	22	34	11	2	11	19
17	Occupational	8	6	3	6	7	1	6	2	0	0	1	4	0	0	10	15	17	12	15	9	16	7	19	34	12	1	6	4
18	Physical	6	5	4	5	4	1	4	1	0	0	1	2	1	0	1	9	10	12	9	6	9	8	11	11	3	1	1	5
19	Vision	4	5	1	2	5	0	4	1	0	0	0	1	0	0	6	9	2	2	3	2	3	2	3	8	1	0	2	2
20	Socialwork	10	7	5	4	8	1	7	1	0	0	0	1	2	0	12	19	5	7	9	3	4	3	6	12	2	1	4	4
21	Psychological	8	6	3	8	8	1	6	1	0	0	0	1	1	1	8	16	7	8	11	4	6	6	16	22	8	2	6	7
22	Homevisits	8	8	6	6	10	2	8	1	0	0	0	1	1	0	14	22	10	9	11	5	7	4	8	11	3	1	2	9
23	Parentsupport	13	8	6	10	15	2	12	1	0	0	0	2	1	0	18	34	12	9	11	6	9	5	10	11	8	2	8	11
24	Specialneedsclass	19	17	4	10	15	2	12	1	0	0	0	3	1	0	14	34	15	11	12	6	10	8	16	34	11	2	11	11
25	Tutoring	5	6	3	5	5	1	5	1	0	0	0	0	0	0	4	11	4	3	4	1	3	3	6	8	11	1	3	3
26	Signlanguage	1	1	0	2	2	1	1	1	1	0	0	1	0	0	1	2	1	1	1	0	1	1	2	2	1	1	0	0
27	Other_therapy	7	1	1	4	2	1	5	1	0	0	0	1	0	0	6	11	1	1	1	0	1	1	2	2	1	0	1	0
28	Head_Start	21	14	8	8	16	2	11	7	0	0	1	2	1	1	18	19	4	5	2	4	4	7	9	11	3	0	0	46

Figure A.10

Speech or language impairment affiliation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
		Library	Play	Museum	Zoo	Observed_Sport	DanceLessons	Participate_in_Sports	Club	Music_Lessons	Drama_Classes	Art_Lessons	Participate_in_Organized_Performing	Craft_Classes	Nonenglish_Instruction	Cultural_Event	Speech	occupational	Physical	Vision	SocialWork	Psychological	Homevisits	Parentsupport	SpecialNeedsClass	Tutoring	Signlanguage	other_Therapy	Head_Start
1	Library	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Play	4	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Museum	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Zoo	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Observed_Sport	3	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	DanceLessons	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Participate_in_Sports	4	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Club	1	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Music_Lessons	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Drama_Classes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Art_Lessons	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Participate_in_Organized_Performing	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Craft_Classes	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Nonenglish_Instruction	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Cultural_Event	2	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Speech	3	0	1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	occupational	1	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
18	Physical	0	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
19	Vision	0	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
20	SocialWork	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Psychological	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Homevisits	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Parentsupport	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	SpecialNeedsClass	2	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	Tutoring	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Signlanguage	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	other_Therapy	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	Head_Start	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure A.11

Learning disability urban affiliation matrix

Figure A.12

Learning disability suburban affiliation matrix

Figure A.13

Learning disability rural affiliation matrix

Appendix G

Network Mappings

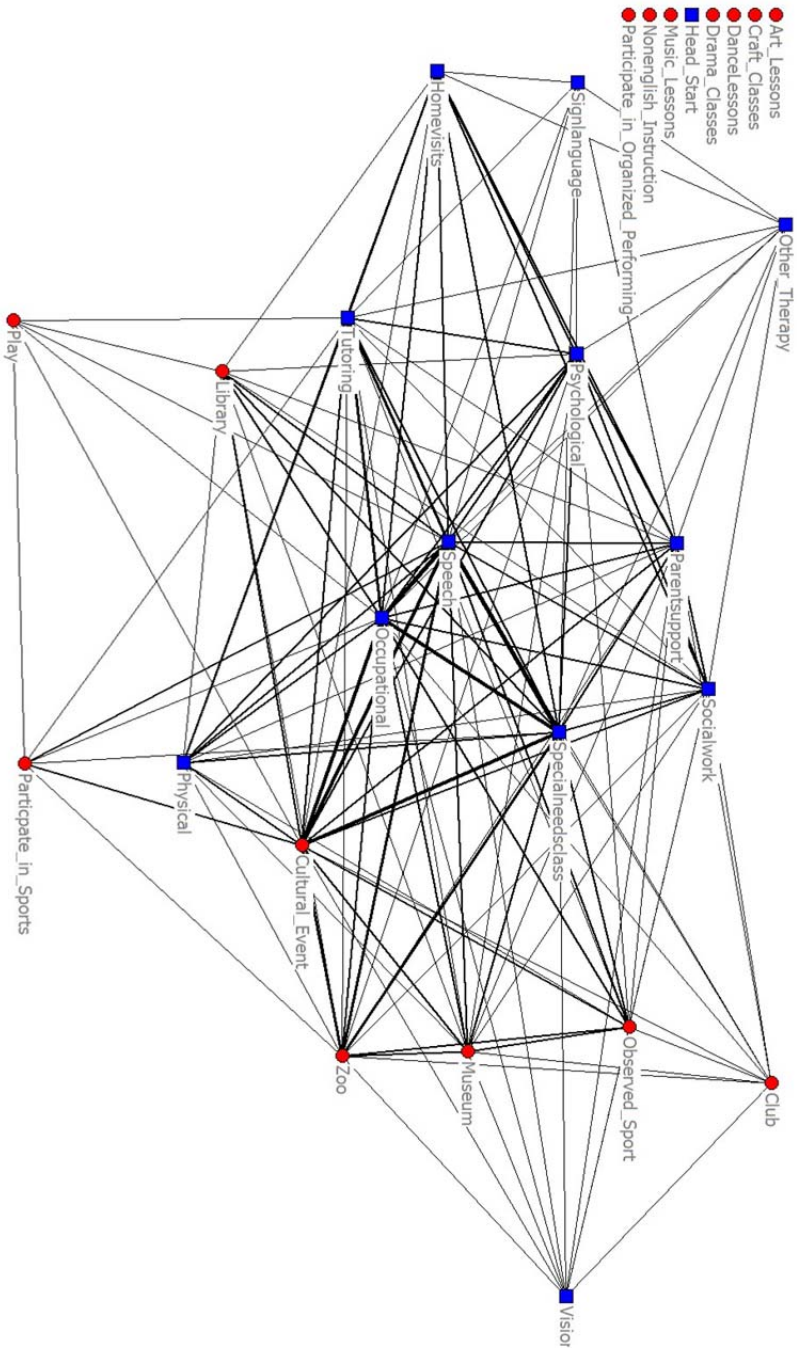

Figure A.14

Autism support network

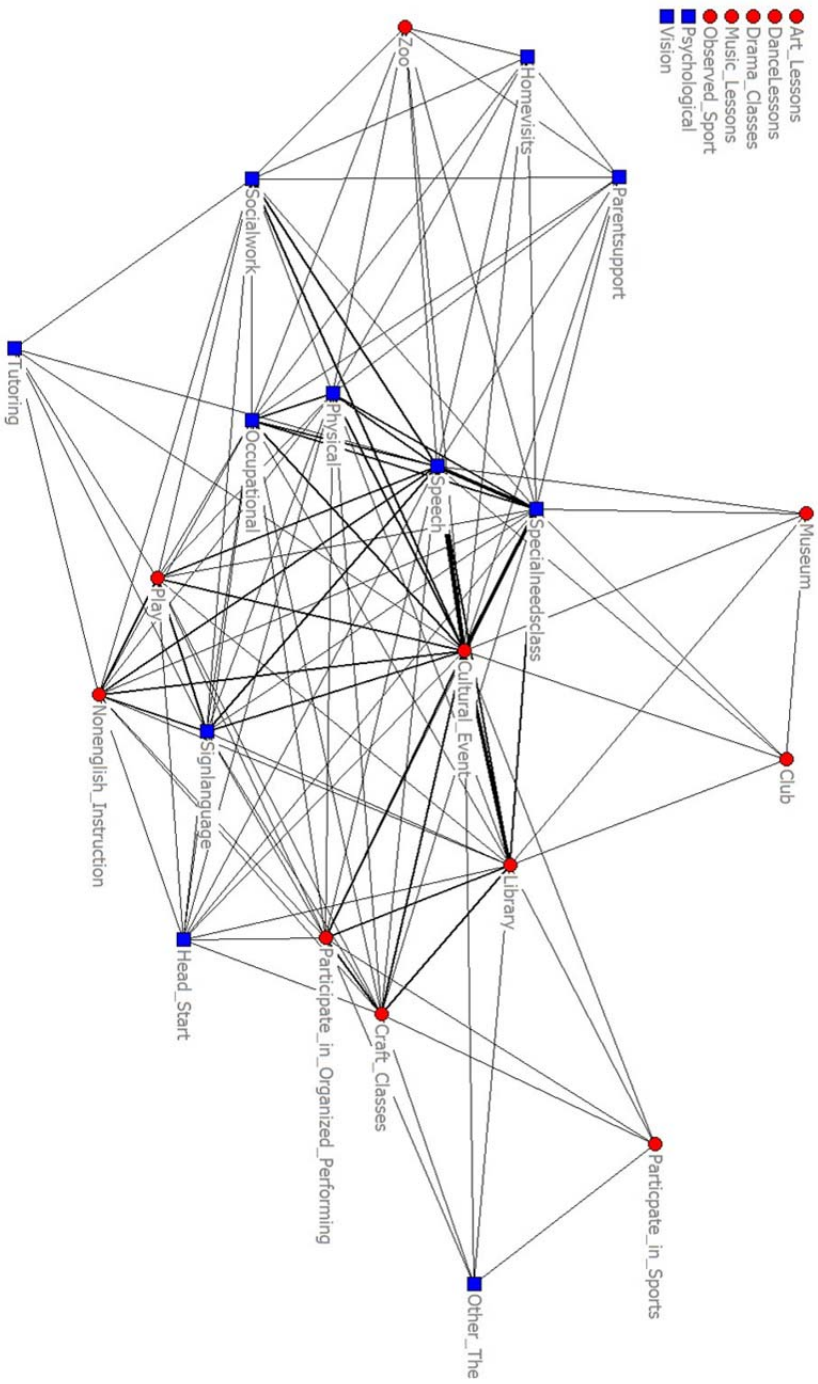

Figure A.15

Deaf/hard of hearing support network

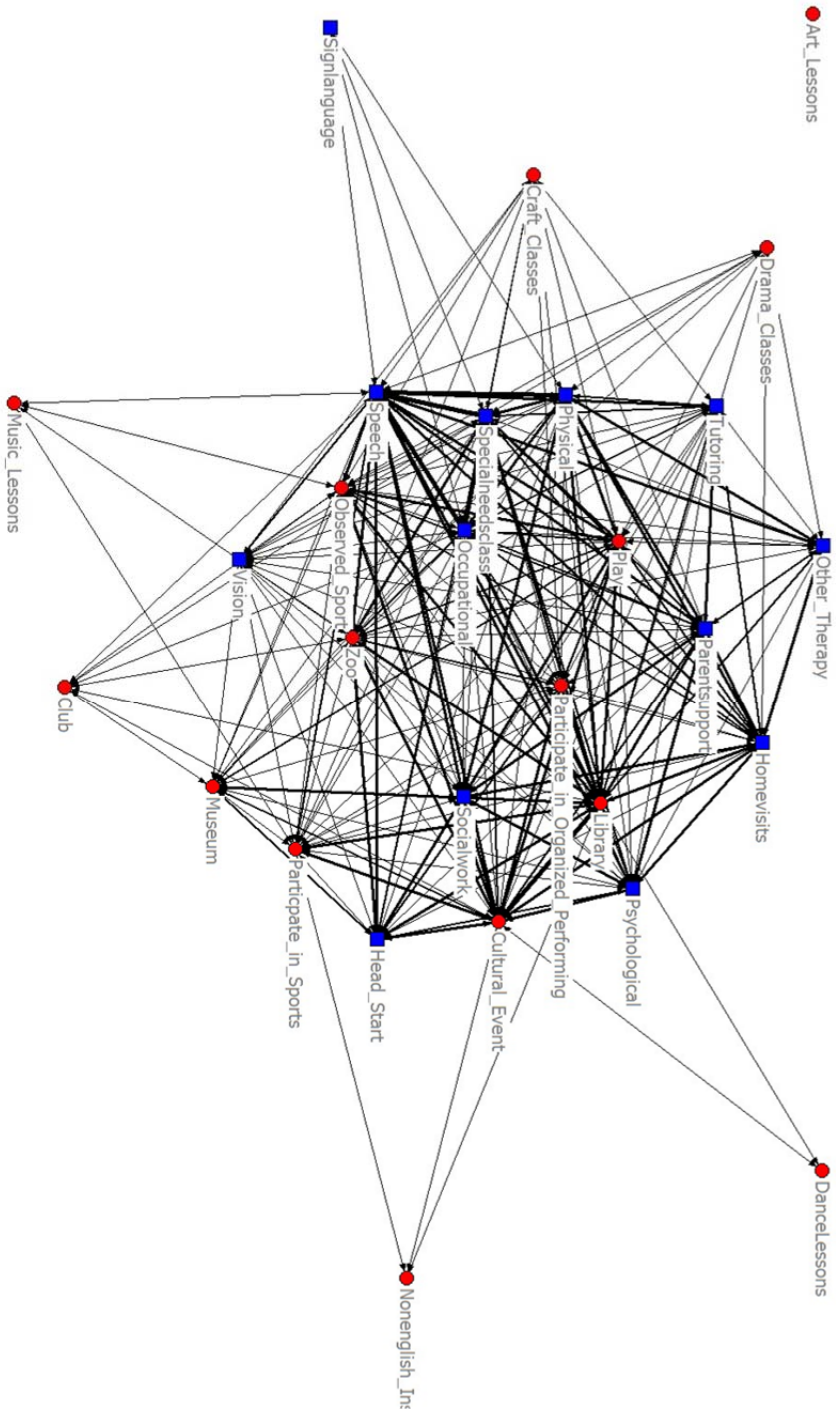

Figure A.16

Developmental delay support network

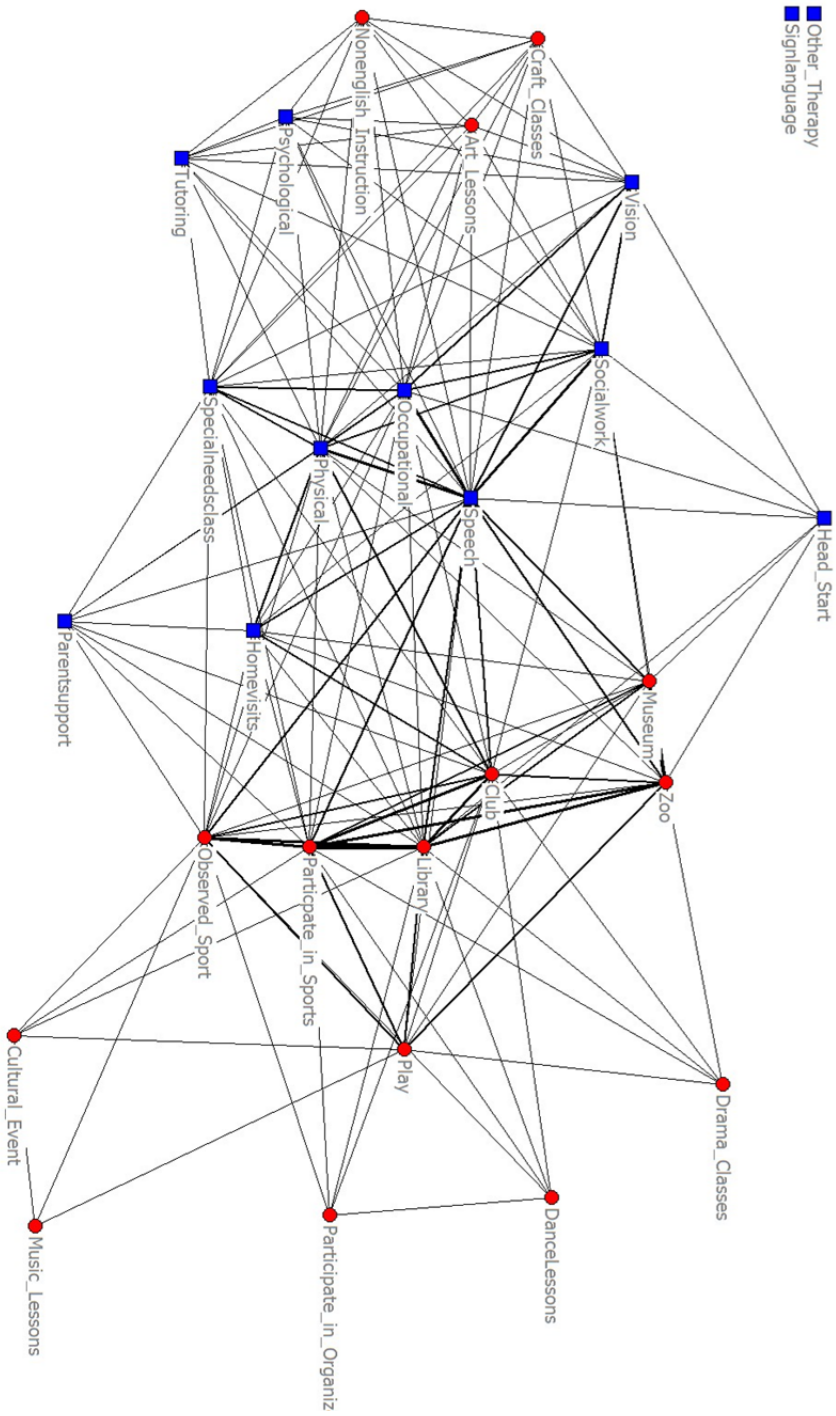

Figure A.17

Health impairment support network

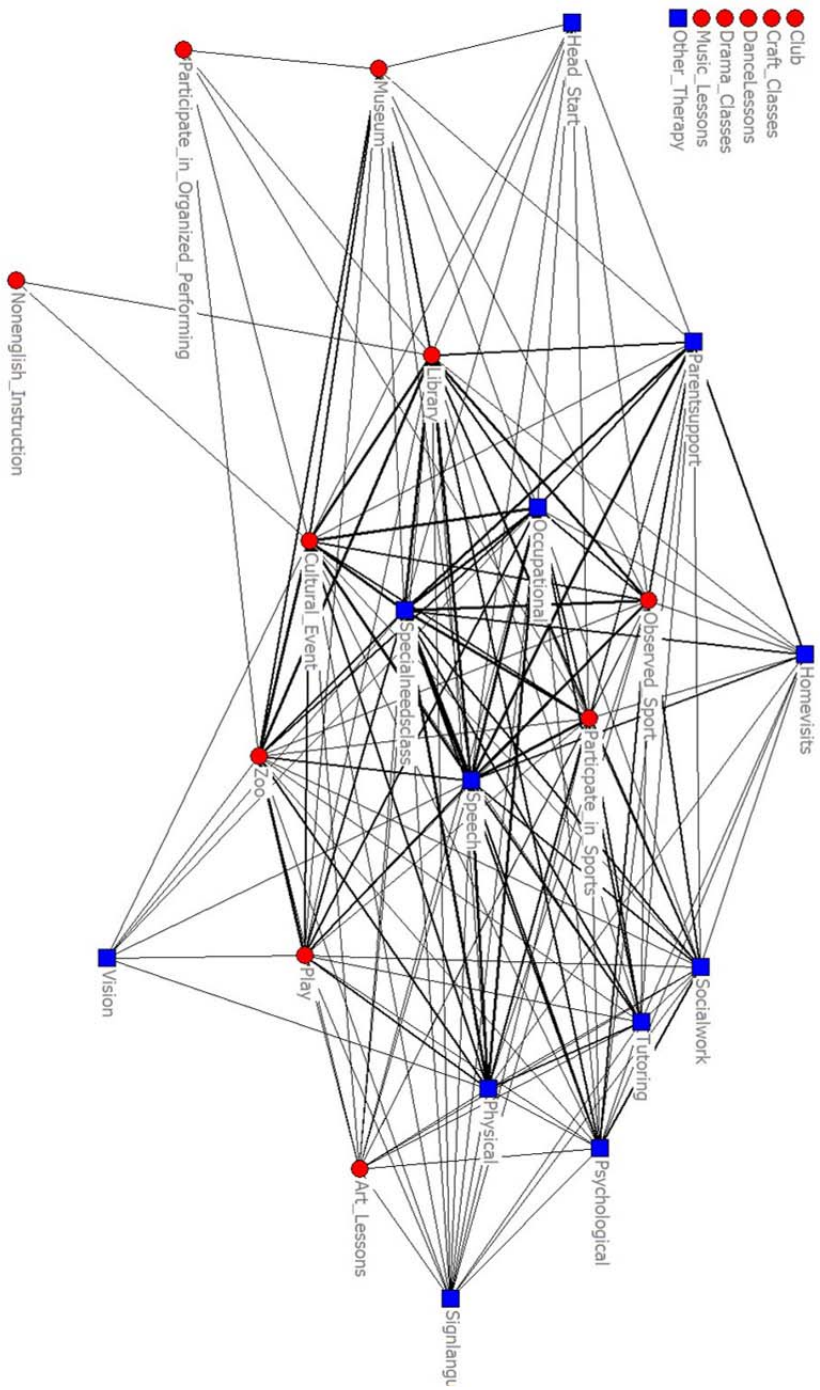

Figure A.18

Mental retardation support network

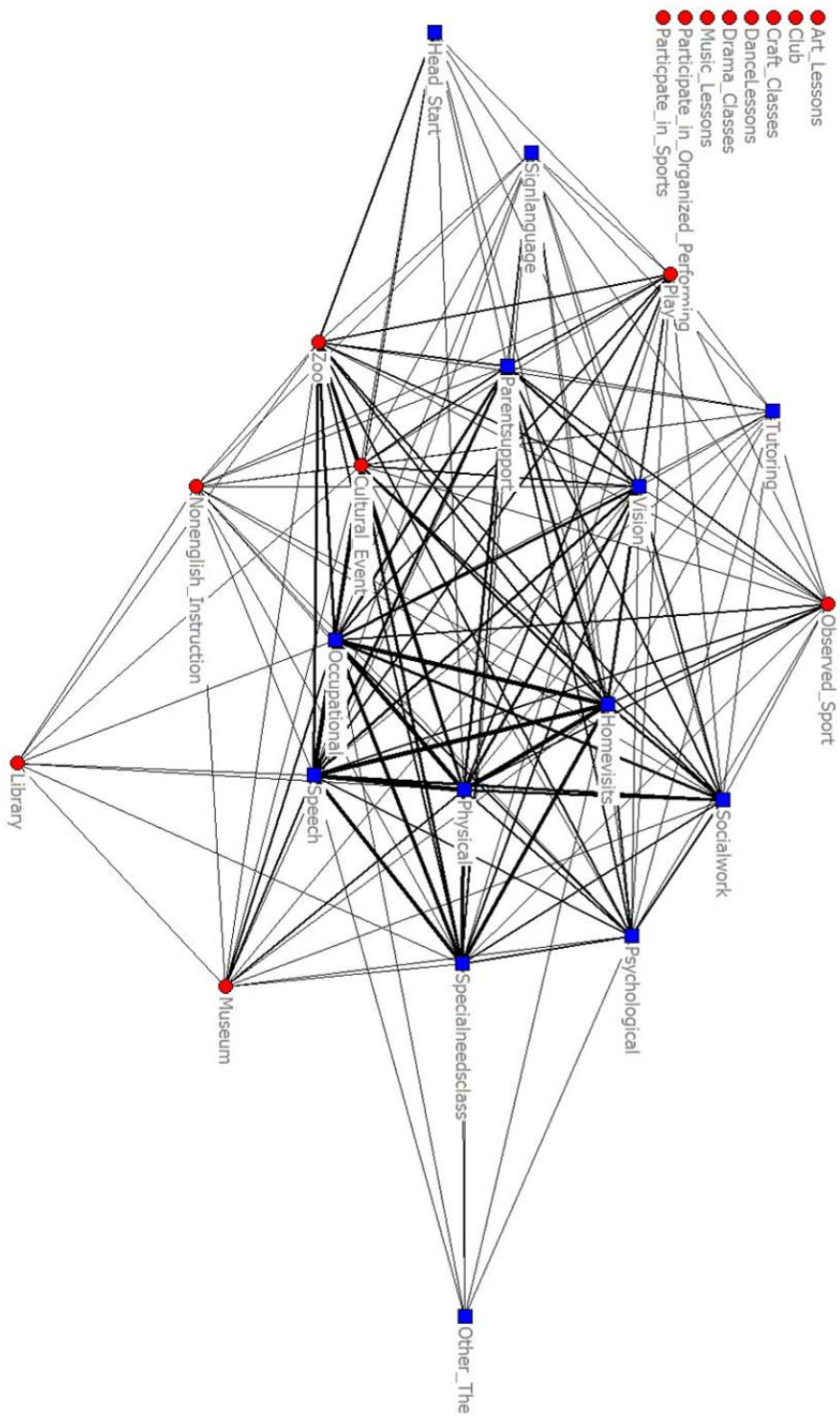

Figure A.19

Multiple impairment support network

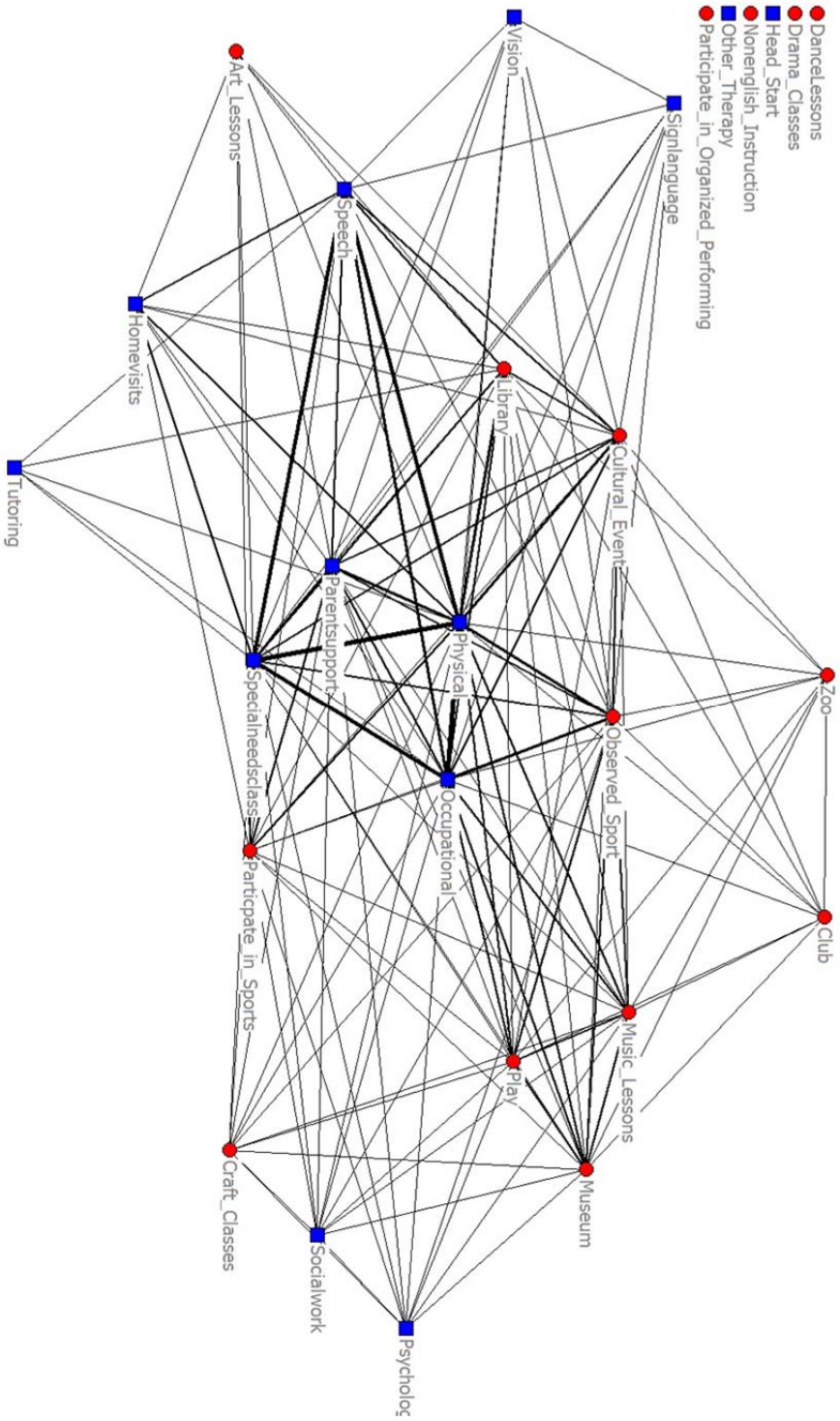

Figure A.20

Physical impairment support network

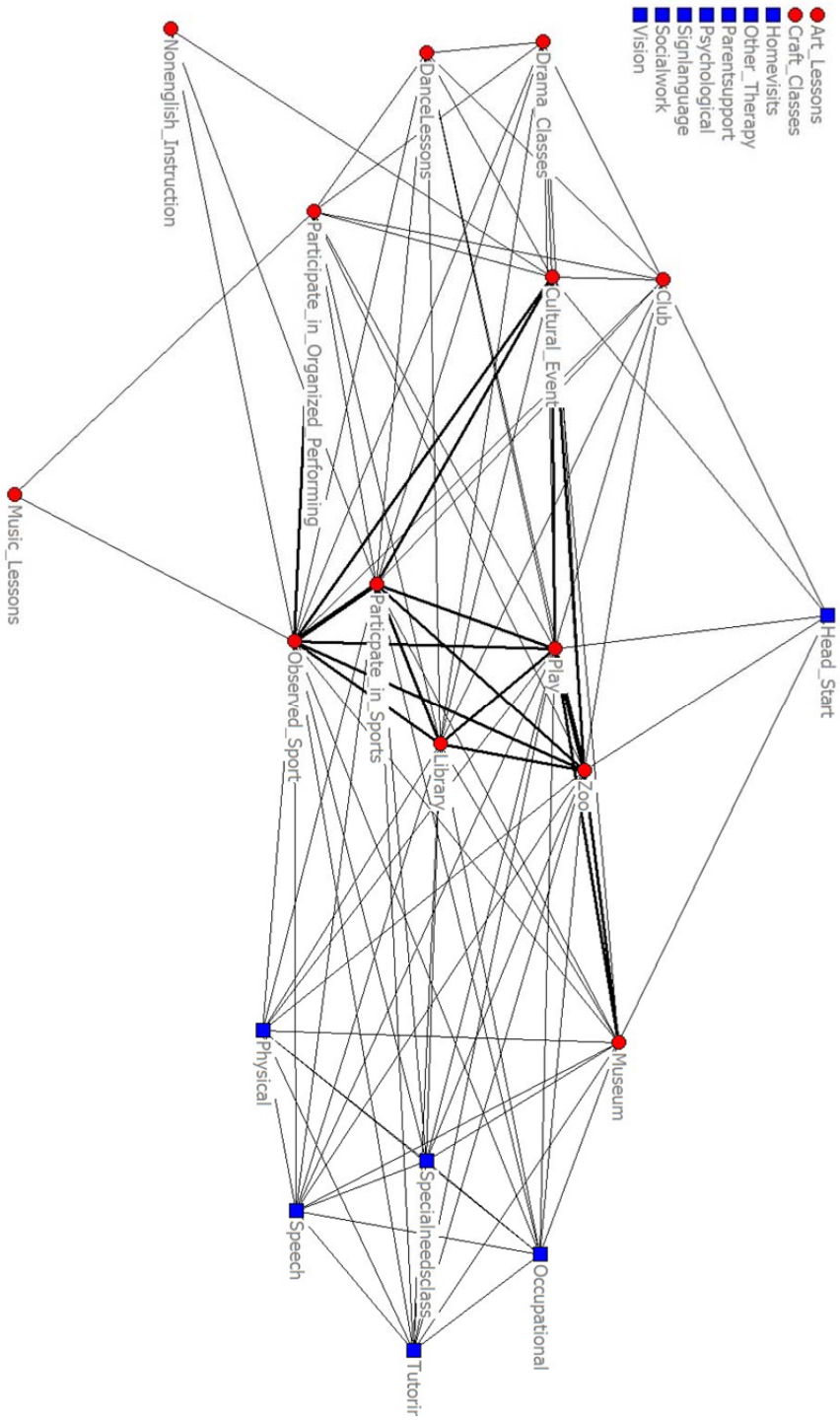

Figure A.21

Serious emotional disturbance support network

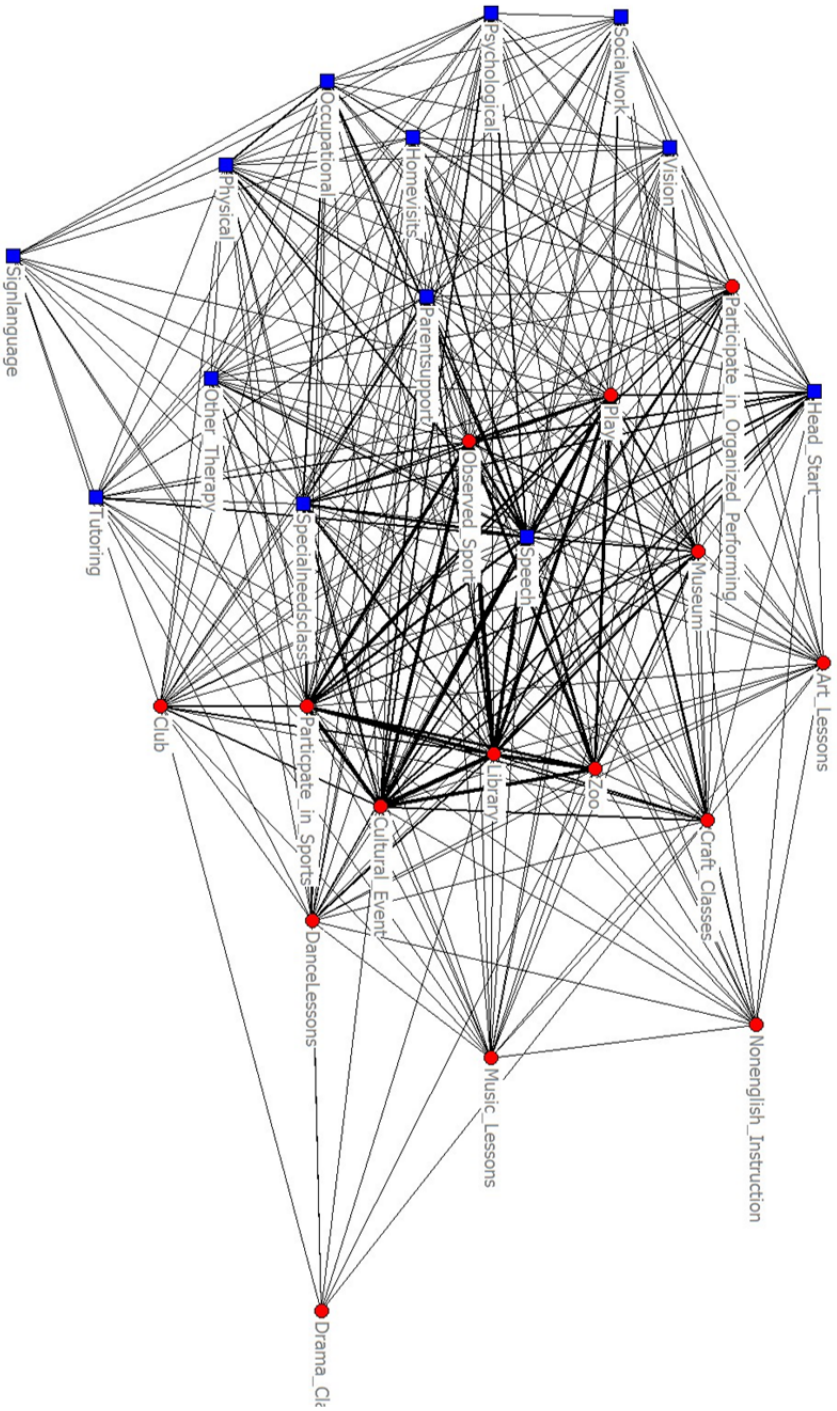

Figure A.22

Speech or language impairment support network

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2011	Cert.	University of Kentucky, Lexington, KY Certificate in College Teaching and Learning and Preparing Future Faculty
2008	M.S.	University of Kentucky, Lexington, KY Educational Policy Studies and Evaluation: Higher Education
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PEER-REVIEWED ARTICLES

Akers, K., & Bradley, K.D. (under review) The tie that binds & loose ends: A social network analysis of graduate committee structure. *Research in Higher Education.*

Knutson, N., **Akers, K.,** Bradley, K.D. (under review) Applying the Rasch Model to measure first-year students' perceptions of college academic readiness. *The AIR Professional File*

McDearmon, J. & **Shirley, K.** (2009). Characteristics and institutional factors related to young alumni donors and non-donors. *International Journal of Education Advancement, 9,* 83-95.

PEER-REVIEWED CONFERENCE PRESENTATIONS
NATIONAL

Akers, K. & McDearmon, J.T. Evaluating patterns in young alumni giving using social networking analysis. Paper presented at the 2011 American Educational Research Association Annual Meeting. New Orleans, LA.

Bradley, K., **Akers, K**., Knutson, N and Cunningham, J. Paper presented at the 2011 American Educational Research Association Annual Meeting. New Orleans, LA.

Royal, K. O'Neil, T. & **Akers, K**. To What Extent is Response Speed a Factor on the American Board of Family Medicine In-Training Examination? Paper presented at the 2011 American Educational Research Association Annual Meeting. New Orleans, LA.

Shirley, K. & Bradley, K.D**.** (2010). The tie that binds & loose ends: A social network analysis of doctoral committee structure. Paper presented at the 2010 American Educational Research Association annual meeting, Denver, CO.

Bieber, J., Goldstein, B., Carey, K., **Shirley, K.**, Kant, K. (2008). Partnerships in Context. Paper presented at the 2009 American Educational Research Association annual meeting, San Diego, CA.

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Knutson, N., **Akers, K.**, & Bradley, K. (2010). Applying the Rasch Model to Measure First-Year Students' Perceptions of College Academic Readiness. Paper to be presented at the 2010 Mid-Western Educational Research Association annual meeting, Columbus, OH.

Sweeney, L., Bradley, K., & **Akers, K.** (2010). A Rasch Measurement Approach to Analyzing Differences in Pencil-and-Paper and Online Formats for Higher Education Course Evaluations. Paper presented at the 2010 Mid-Western Educational Research Association annual meeting, Columbus, OH.

Shirley, K. & McDearmon, T.J. (2010). Evaluation of young alumni giving using the Rasch model. Paper presented at the 2010 University of Kentucky, College of Education Spring Research Conference, Lexington, KY.

Shirley, K. & Bradley, K.D. (2009). Examining graduate committee faculty compositions- A social network analysis example. Paper presented at the Mid-Western Educational Research Association annual meeting, St. Louis, MO.

SERVICE ACTIVITIES

2010-current	President, Kappa Delta Pi, University of Kentucky
2010-current	President, Educational Policy Studies and Evaluation Student Group, University of Kentucky
2010	Conference proposal editor, Mid-Western Educational Research Association

2010	Division Chair, Mid-Western Educational Research Association Conference
2009-current	Student Reviewer, Mid-Western Educational Researcher Graduate
2009-current	Graduate Member of Omicron Delta Kappa, national leadership honorary
2009-2010	Vice President, Graduate Student Congress, University of Kentucky
2008-current	Departmental Representative, Graduate Student Congress, University of Kentucky

TRAININGS AND WORKSHOPS

2010	National Center for Education Statistics ECLS-K database training seminar
2009	Practical Rasch Measurement - Further Topics by Dr. J. Michael Linacre Course completed at www.statistics.com.
2008	Association for Institutional Research Applied Statistics Institute

PROFESSIONAL AFFILIATIONS

2009- current	American Educational Research Association (AERA)
2009- current	Mid-West Educational Research Association (MWERA)
2007-2009	Association for Institutional Research (AIR)

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